

MAY 1921 ~ No. 184

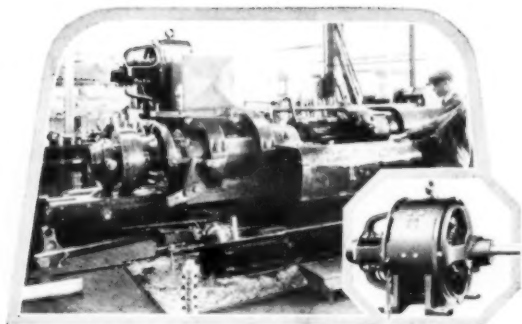
Monthly

A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A-H-HITCHCOCK
1220-1235 Caxton Building
Chicago



Production doubly assured

You have but one thing in mind when buying a machine like this—it's production—more parts at less cost.

You can be doubly sure of the cost cutting results which you expect if the driving power is a rugged, well-built motor like the Reliance Type T.

These motors represent the everyday shop experience of 35 electrical engineers who know what motors must do in metal working plants. As a result you can be sure that Type T motors will do more than meet ordinary needs. They will stand the extra strain when you are crowding your machines for more production.

Specify Type T motors and get the best results which good machine tools can give.

Reliance Electric & Engineering Co.

1050 Ivanhoe Road, Cleveland, Ohio

Branches:

Boston New York Philadelphia Pittsburgh Cincinnati Detroit Chicago

We specialize in motors, sizes 1/2 to 150 h. p., constant and adjustable speed D. C., squirrel cage and slip ring A. C.

Type **Heavy Duty**
RELIANCE MOTORS
Direct Current

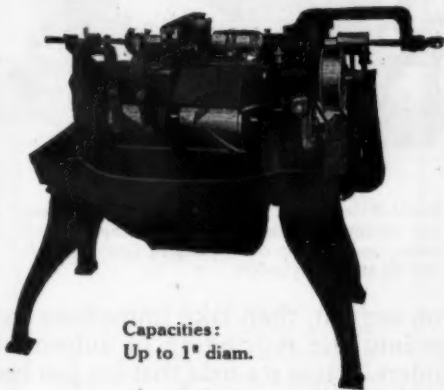




Time-savers for Studs

There are many ways of threading studs, but the way to thread them at the lowest cost per piece is Automatically—on NAMCO Stud Threaders.

Blanks are automatically fed from the magazine and one operator takes care of three or more machines. NAMCO Self-Opening Dies insure accurate threads, and the time between cuts is reduced to minimum. Doesn't that sound like the right way?



Capacities:
Up to 1" diam.

THE NATIONAL ACME COMPANY CLEVELAND, OHIO

New England Plant, Windsor, Vt. Canadian Screw Plant, Montreal, P.Q.

Branch Offices:

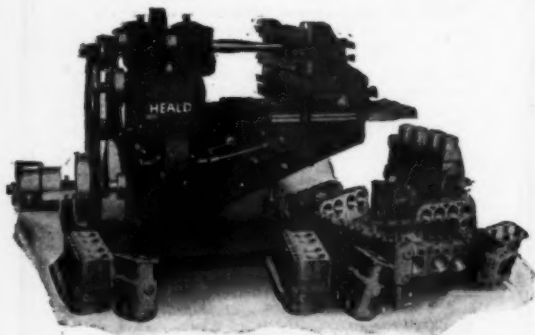
NEW YORK BOSTON CHICAGO DETROIT BUFFALO

WAREHOUSES—NEW YORK and CHICAGO

REPRESENTATIVES IN PRINCIPAL FOREIGN COUNTRIES

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies, Collapsing Taps and Screw Machine Products at Cleveland, Ohio

Are YOU Busy?



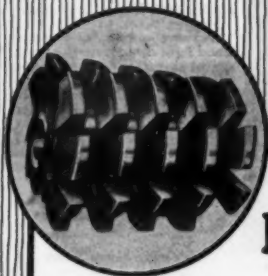
Heald Style No. 55 is simple, moderately priced, self contained and has a very large capacity and range, easily taking care of singles, doubles, fours and six en bloc cylinders.

If you are not, then take immediate steps to go into the regrinding of automobile cylinders. Here is a field that has just been opened and the possibilities are enormous.

We have compiled data regarding the possibilities, profits, and equipment required. This data will interest you. Wire, phone or write, immediately.

The Heald Machine Co.

6 New Bond St., Worcester, Mass.



Hobs

Prompt deliveries are being offered on Brown & Sharpe Hobs for Worm Wheels, Spur Gears or special purposes.

This offer is being taken advantage of by manufacturers with an eye to the future. Check up your Hob and Cutter equipment—be ready for all orders that require accuracy and speed, the winning combination that has made our cutters the favorite.

BROWN & SHARPE MFG. CO.
PROVIDENCE, R. I.



SAVE spoiled work due to poor lighting; Save half the current; Save eye strain; Save Lamp Breakage.

Increase output by having a good light directly on the work; on the thread you are cutting; in the hole you are boring; right at the spot you are working. Instantly adjustable; stays where it is put.

We will send one of these lamps to any plant or factory on approval.

Send for our literature on machine shop specialties.

We make Money Savers.

The Will-Burt Company

Orrville, Ohio



Belt Driven

Dupont Power Hammers

Belt or Motor Drive

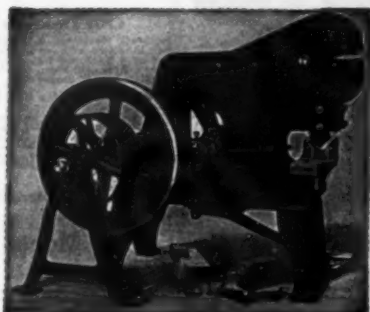
These hammers embody a design and workmanship that are unsurpassed.

Specifications on Request

United Hammer Co.

45 Bromfield St., Boston, Mass.

Punches—Shears—Bending Rolls
The Beloit
Combined Power Punch And Shear



Built in six sizes. Nos. 51, 52, 53, 54, 55 and 56

Direct connected motor or belt drive

This is the best all around punch and shear in a combined machine of moderate cost. It is heavy and substantial, and amply back geared to require the minimum amount of power; is strong, compact, and easy to operate. Can be equipped with angle shearing attachment, architectural jaw, or for special work.

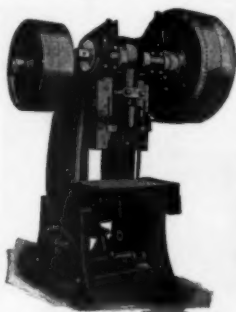
We are putting out a complete line of punching and shearing machinery in both power and hand tools, also light and heavy duty bending rolls.

We do not overrate the capacities of our machines.

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

L-J Heavy Duty Inclinable Power Press



TWENTY-FIVE years of specialized technical experience lies behind this efficient press. Embodies latest improvements for quick, perfect and large output. Made also in the flywheel and geared type.

Our Dealers

Herberts Machinery & Supply Co.,
San Francisco and Los Angeles, Cal.
Northern Machinery Co., Minneapolis
Brown-McDonald Mch. Co., St. Louis
English Tool & Supply Co., Kansas
City, Mo.
Stocker-Rumely-Wachs Co., Chicago
W. J. Baird Machinery Co., Detroit
Cyril J. Bath & Co., Cleveland, Ohio
Reliance Mch. Sales Co., Pittsburgh
M. D. Larkin Supply Co., Dayton, Ohio
Joseph Beal & Co., Boston, Mass.
Dale Machinery Co., Inc., New York
J. L. Lucas & Son Inc., Bridgeport, Conn.

Write to the nearest, or

Loshbough-Jordan Tool & Mche. Co.
Elkhart, Indiana

The Emco "W"

Bench Power

Punch Press

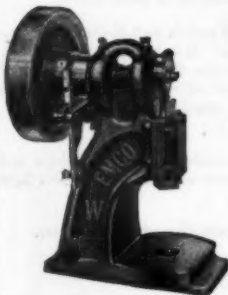
NOW MADE IN
 $\frac{3}{4}$, $1\frac{1}{4}$ or $1\frac{3}{4}$ " stroke

We make also

**Automatic
Roller Feed**
for all styles

Also Emco "V" Bench

HORN PRESS
for **ASSEMBLING**



The Enterprise Machinery Co., 28 S. Clinton St.
CHICAGO, ILL.

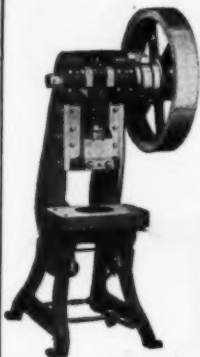
Spring Foot Press

Write For Circular



The Taylor & Fenn Company
Hartford, Conn., U. S. A.

Here Is A Press



With Plenty of Steam
Back of THE PUNCH

HIGH DUTY
ROCKFORD
PUNCH PRESSES

Made in straight side and
inclinable types. Their great
power backed by rigid design
enable them to do the work
you demand, and stand up to it.

Write For Catalog

Rockford Iron Works
Rockford, Ill.

Complete Line of Willard Power Presses

(Inclinable Open Back)



For Efficient, Economical
Sheet Metal Press Work

Built for hard service and embodying
the latest power press improvements.
All parts practically interchangeable.
High grade steel shaft capable of with-
standing the heaviest strains. Latch
has positive safety stop making it im-
possible for press to "repeat" until the
treadle is pulled clear down.

Powerful--Accurate--Durable

Full details on request

The Willard-Middletown Machine Co.
Cincinnati, Ohio

Successors to The Willard Press & Tool Co.

"G. A. Lewthwaite" Quality Tools



"The Punch With A Punch"

It has always made good. Try it out on your toughest jobs and you'll be satisfied. High grade steel, plus top notch tempering efficiency tells WHY.

Sheet Iron Shear and Rod Cutter

High and un-
Lewthwaite"
secret of its up-
its. Invaluable for
by sheet metal workers,
boilermakers, and blacksmiths.
yond its rated capacity. Soon
for itself.

Grade material, superior mechanism
sual cutting power of the "G. A.
Shear and Rod Cutter are the
standing productive mer-
most jobs handled
shipbuilders,
Cuts be-
pays

Also

Pipe Benders
Bar Benders
Power Presses
Foot Presses
Etc., Etc.



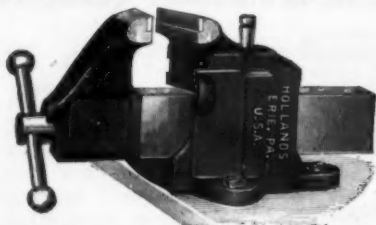
BAR SHEARS, $1\frac{1}{4}$ " capacity and smaller.
PLATE SHEARS, $\frac{3}{8}$ " capacity and smaller.

Write for our Catalog of Iron-Workers' Tools

George A. Lewthwaite Co.
116 Walker St., - - New York

Hollands Vises

Have made good
for 33 years



HOLLANDS VISES are made with solid or swivel jaw and stationary or swivel base, and each is a leader in its class. Machinists' Vises, Filers' Vises, Woodworkers' Vises—what do you need? Write for latest price list.

Hollands Tool Co., (Established in 1887) **Erie, Pa.**

Whitney ^{Ball Bearing} Punch No. 40

This style of Whitney Ball Bearing Punch is equipped with Ratchet Head and Socket Handle.

Capacity, $\frac{3}{4}$ " thru $\frac{3}{8}$ " iron
Depth of throat, 3"
Height of throat, 2"
Weight complete, 87 lbs.

The elimination of friction enables us to design all Whitney Punches to do more work at less cost.

Write for Catalog and Price List

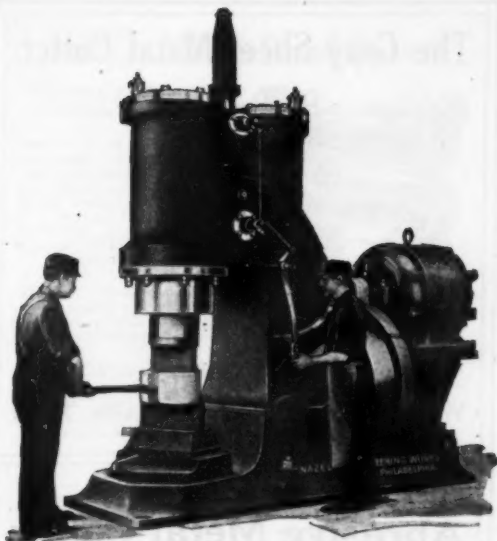


Ball
Bearing
Punches
in
many
styles
and
sizes

Whitney Metal Tool Co.

109-111 Forbes Street,

Rockford, Ill.



In a Hammer, after all is said and done,

It's the Blow that Counts

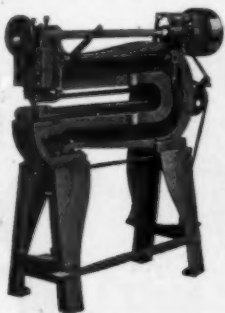
Anybody can strike a piece of steel with a hammer, but that doesn't make him a Tubal-cain. Any power hammer will strike a blow, but that doesn't mean that it will do what the Nazel Air Hammer will.

It is the delicacy of control, rivalling in accuracy the arm of the skilful smith, which gives the blow that counts, and the Nazel its peculiar effectiveness. The result is more work accomplished for each unit of time and labor expended, and therefore a higher economy. The reason you should have it is that it will pay you. Let us prove that.

*A Nazel Hammer Book can't hurt you; it may help you.
Send for it; it's free.*

Nazel Engineering & Machine Works
Nictown, Philadelphia, Pa.

The Gray Sheet Metal Cutter



"Tell us who uses it and we'll tell you how good it is"

Its users include the best concerns from New England to California, such as American Radiator Co., Victor Talking Machine Co., United Shoe Machinery Co., General Electric Co., American Locomotive Co., Union Hardware Co., Ford Motor Co., etc., etc. Send for long list of prominent users and testimonials.

The four sizes cut $\frac{3}{8}$ ", $3/16$ ", $\frac{3}{4}$ " and $\frac{1}{2}$ " plate, any intricate pattern, easily, quickly and cheaply, leaving edges smooth and metal flat.

Write for the full data

W. J. SAVAGE CO., Knoxville, Tenn.
Alfred Herbert Ltd., Exclusive Foreign Representatives.

Peter Brothers' Ball Bearing

Abrasive Metal Cutter

Eliminates Nicking, Breaking and Grinding

Makes a smooth, decisive cut through high speed steel, brass, copper, aluminum and all other metals. The bearings as well as the countershaft are ample to secure *long life and accuracy*. Get your toolmaker this cutter and he'll do *more work in less time*.

8" Size \$22.50, with C. S.

Splendid for tool room. Cuts high-speed steel up to $\frac{1}{4}$ " square.

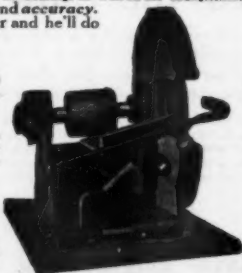
12" Size \$60, with C. S.

Cuts up to $\frac{3}{4}$ " diameter, round or square, at any angle up to 45 degrees. Ball bearing.

15 Days' Free Trial

Write us or ask your dealer

PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.



MARVEL Metal Band Saw No. 8

**Blade Tilts 45 Degrees
To Right or Left**

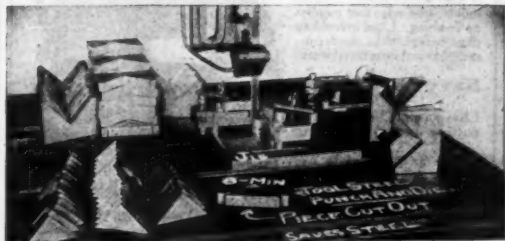
*Tilted Position For
Cutting On an Angle*



A UNIVERSAL METAL CUTTING band saw of unusual design and completeness. It has exceptional ease of operation, wide range and great capacity. The special feature of the tilting blade allows sawing at any angle up to 45 degrees while work is held stationary in vise. Saw blade is mounted on two flanged wheels supported by a very rigid frame which is pivotally carried on a frame under table. Capacity of throat: depth 18 in.; height 20 in.; at 45 degrees the height is 14 in.

Wouldn't you like to know more of the details? Write to

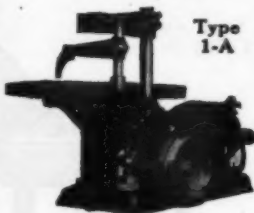
Armstrong-Blum Mfg. Co.
341 N. Francisco Ave., Chicago, Ill.



J & B Filing and Sawing Machine Doubles Output and Cuts Costs

In these days of close figuring, this simple and productive filing and sawing machine saves its cost in a short time. An apprentice turns out more and better work than a first class machinist can by hand filing.

On many jobs it insures a direct saving up to 60%. It can operate where file does not go thru or past work, or where file has to groove out a shoulder.



Type
1-A

30 DAYS' FREE TRIAL

Return at our expense if not the time saver we claim

JOHNSON & BIDDLE TOOL CO., ELKHART, INDIANA

"QUICKWORK"

Registered In U.S.A. and Foreign Countries

Rotary Shears

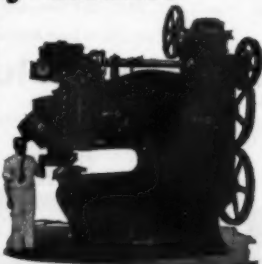
Made in 7 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

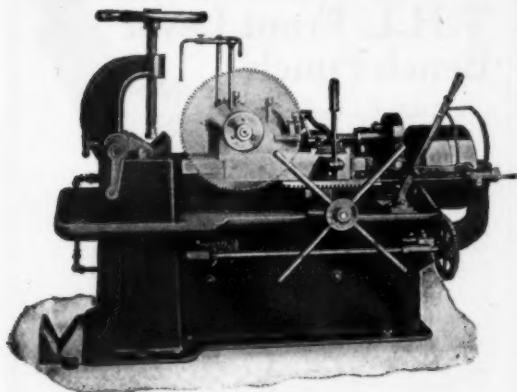
Write for catalogue No. 60



Patented June 3, 1913; Aug. 26, 1919.

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.
Cable Address "Quickwork," "W. U." and "General" Codes

The Knowlton Metal Saw Cut-off Machine



Model Two

Send to the nearest dealer for a circular of this powerful Cold Saw and find out about its large capacity, cutting speed and reasonable price.

| | |
|-----------------------------------|-------------------------------|
| HILL CLARKE & CO. | Boston |
| BARBOUR, LOVE & WOODWARD, | New York City |
| BANKS SUPPLY CO., | Huntington, W. Va. |
| HERBERTS MACHINERY & SUPPLY CO. | San Francisco and Los Angeles |
| WOLVERINE MACHINERY & SUPPLY CO., | Detroit |
| FRANK TOOMEY, INC., | Philadelphia |
| BROWN McDONALD MCHY. CO., | St. Louis |
| GENERAL MACHINERY CO., | Spokane |
| SUNDERLAND MACH. & SUPPLY CO., | Omaha |
| NORTHERN MACHINERY CO., | Minneapolis |
| FEDERAL MCHY. SALES CO., | Milwaukee and Chicago |
| THE NATIONAL SUPPLY CO., | Toledo |
| McMULLEN MACHINERY CO., | Grand Rapids |
| KEMP MACHINERY CO., | Baltimore |
| NEILL & VIELLE SUPPLY CO., | Louisville |
| DAY MACHINERY CO., | Buffalo |
| YOUNG & VANN SUPPLY CO., | Birmingham, Ala. |
| THE PATTERSON TOOL & SUPPLY CO., | Dayton |

Manufactured by

KNOWLTON MACHINE COMPANY
WESTBROOK, MAINE

"High Grade Tools"

T.H.L. Front Lever Bench Punch

**Stands Up Under
Longest, Toughest
Wear and Tear**

Price \$60

Extra Punches, 35 cents each,
\$3.75 per dozen. Extra Dies,
40 cents.

Capacity 13/32" thru 1/4" steel,
11/32" thru 5/16", and up to 1/2"
thru thinner metal.

Weight 70 lbs.

Adjustable gauge. Punch cannot
lose alignment with die. Made of
best materials. All parts inter-
changeable.



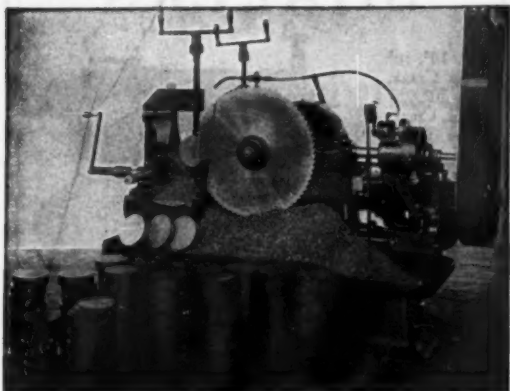
"T.H.L." Quality Punches and Dies

They're accurate, durable and
highly productive, because: (1)
Made of the best tool steel;
(2) They are built for power
and ruggedness; (3) They are
individually tempered with
great care.

One trial will convince you

T. H. Lewthwaite Machine Co.
417 East 31st St., (Est. 1890) New York City
'Phone, Murray Hill 3117

Cochrane-Bly No. 5 Cold Saw



144 Blanks 5 $\frac{1}{4}$ " Diameter Cut on This Machine in 8 Hours.

Actual Cutting Time Was 3 Minutes and 10 Seconds Per Cut.

Will Also Cut in Multiple at one Time

| 76 Bars $\frac{1}{2}$ " Diameter | | | |
|----------------------------------|---|-------------------|---|
| 26 | " | 1 " | " |
| 13 | " | 1 $\frac{1}{2}$ " | " |
| 8 | " | 2 " | " |
| 4 | " | 2 $\frac{1}{2}$ " | " |

Five Sizes to Suit All Requirements up to 8 $\frac{1}{2}$ " Round Bar.

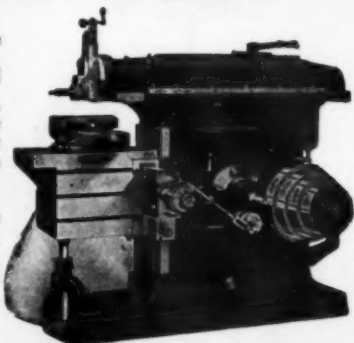
Write for Catalog

Cochrane-Bly Company
Rochester, N. Y.

SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Gear-
ed Crank,
Single Pul-
ley Drive.



The Smith & Mills Co. Station B,
Cincinnati, O., U.S.A.

Shapers

The best medium
priced Shaper on
the market.

Built in 16", 20",
and 24" sizes, all
back geared crank
machines.

V-type ram.
Double face bull
gear.



Ask us about them

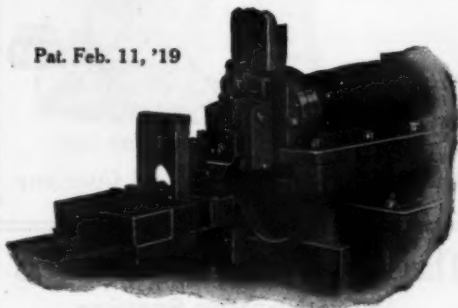
The Osborne & Sexton Mchy. Co.
Columbus, Ohio

BRUNO

Slotting Attachment

for Shaper and Planer

Pat. Feb. 11, '19



A cutting tool holder which converts your shaper into a Horizontal Slotter and makes possible the most intricate shaping such as is required for dies, jigs, gauges, keyways, slotting, etc.

Write for circular. Dept. H.

H. A. MOORE CO.
ROCHESTER, N. Y., U. S. A.

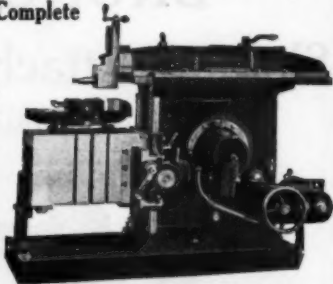
COLUMBIA SHAPERS

Modern and Complete

It's what you
get, not what
you pay, that
really counts.

Discriminate.

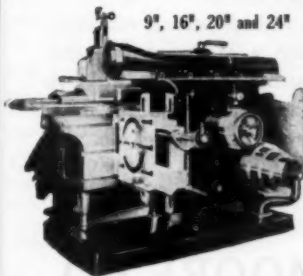
Buy a MODERN
Shaper.



16', 20', 24', 28', 32'

The Columbia Machine Tool Company
Hamilton, Ohio

The "MILWAUKEE" Offers 100% Shaper Service



9', 16', 20' and 24'

The positive stroke control is instantly adjustable. The Friction Locking Device, positive in action, stands up under the *heaviest* strains. Swivel tables can be swung to any angle. Rugged ram with "V" ribs operates without vibration. Powerful back gearing. Rigid column.

Want particulars?

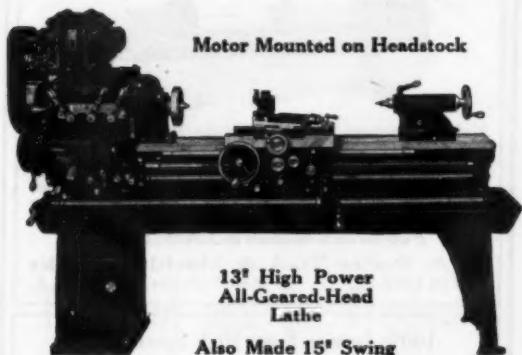
MILWAUKEE SHAPER CO.,

Milwaukee, Wis.

Willard MATTMAN Lathe BRATTEN

(Double Back Geared—Quick Change)

Ideal For Tool Room Operations



The NEW WILLARD Tool Room Lathe is completely redesigned throughout and is offered as the latest modern all-geared-head lathe, capable of the most economical, efficient and varied tool room production.

The headstock is a full box section, rigid and self-contained. All speed changes are selective inside the headstock. Chrome nickel steel gears, and hardened sliding gears. The gears in headstock run in oil.

It is impossible to throw in two speeds at the same time. Six direct speeds are available. Six further speeds are obtainable through the back gears, or a total of *Twelve Speeds*.

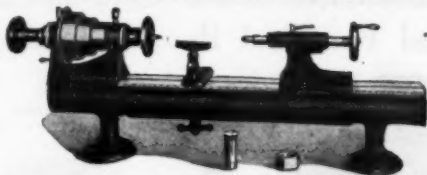
All shafts are equipped with SKF bearings.

Write for full details of this unusual machine tool

The Willard Machine Tool Co., Inc.
F Street, Box 784 - CINCINNATI, O., U. S. A.

POTTER No. 5 BENCH LATHE

RIGID, ACCURATE, ADAPTABLE

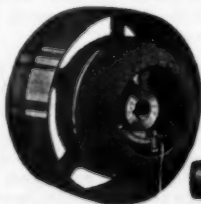


Made first for our own special use, subjected to the most varied, rigorous tests, we offer POTTER No. 5 with absolute confidence as to its superior merits. Among its improvements are: Compound Slide Rest, Double Cross Slide, Lever Tailstock, Tailstock Turret, Internal Grinding Attachment, Thread-Cutting Fixture, Milling Attachment, 3-Speed Grinding Counter, Large Turret Fixture, Improved Lever Chuck Closer, Universal Grinding Attachment, 2-Speed Plain Counter, Mounted Headstock.

It will pay you to investigate this UNUSUAL LATHE

S. A. Potter Tool & Machine Works
71 East 130th St., New York City, N. Y., U. S. A.

100% Service From High Speed Tools With Edgemont Friction Clutch



Enclosed Type, Self-Oiling

These Friction Clutches are backed by many, many years of highly successful service of the foremost Machine Manufacturing Plants in the U. S.

In the heaviest and severest tests on thousands of heavy duty machines they have always won out.

Built for the most rugged work. Thrown in and out smoothly and easily.

Their pulling power is equal to that of the belt at whatever speed required.

Send for Catalog of the Edgemont Line

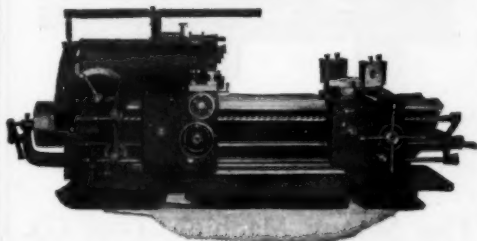
The Edgemont Machine Co.
Dayton, Ohio

Special Clutches and Transmission Machinery for all purposes.

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



The Tool and Its Product

The tool invariably bears a direct relationship to its product. A good tool, well designed, and of proper construction means accurate work at very low production cost. There are many money-saving features about the STEINLE TURRET LATHE that instantly appeal to the careful buyer. The general massive construction, the ease of operation of all parts, the single pulley drive and 30 reversible spindle speeds, the power rapid traverse of both carriages, the power cross feed of side carriage and the general adaptability to special tooling, enabling rapid, accurate, and economical production—these are strong points well worth considering.

STEINLE LATHES are widely used by leading concerns. They can produce for you as they are now producing for others.

Why not send us your blue prints and let our Engineering Department determine what can be done on your own work?

Sidney Medium and Heavy Duty **Lathes**

Include Lathes for every class of work
In shops of any size or type



MEDIUM DUTY LATHES in 14", 16", 18" and 20" swing.

HEAVY DUTY LATHES in 15", 17", 19", 25", 27", 30" and 36" swing. They give satisfaction everywhere.

Write for Bulletin No. 45

The Sidney Machine Tool Co.
Sidney, Ohio

DAVIS MACHINE TOOL CO.

ROCHESTER, - - NEW YORK

MANUFACTURERS OF—

14—16" Close Coupled Tool Room Lathes.

12—14—16" Engine Lathes.

24"—Chucking Lathes.

14—16—20—24" Shapers.

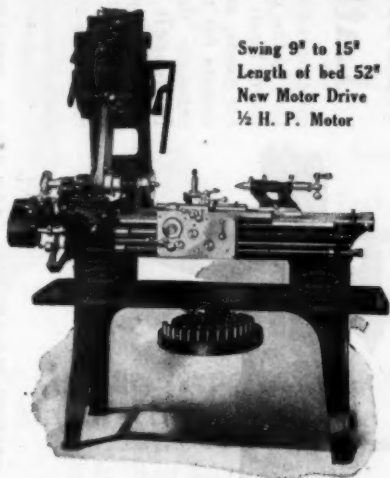
3—4½—6" Cutting-off Machines.

No. 1—2 Keyseaters.

20" Drill.

Complete information upon request

It Anticipates Every Requirement
Cataract Precision Lathe
With Quick Change Swing



Swing 9" to 15"
Length of bed 52"
New Motor Drive
½ H. P. Motor

Behind the CATARACT lies the matured technical and mechanical skill of thirty eight years spent in designing and building the well known Cataract Line of Machine Tools.

Absolute accuracy, unusual range, adaptability and ease of operation are its chief upstanding merits.

The bases of heads and tailstocks are perfectly aligned. Sixty-hole index insures the cutting of double, triple or quadruple threads. Steel spindle is hardened, ground and lapped.

Its capacity is considerably extended by the 3" raising blocks, increasing swing to 15".

Write for Catalog, which is profusely illustrated, with specifications and thread cutting and metric gear tables.

HARDINGE BROTHERS, Inc., Chicago, Ill.

Monarch Lathes

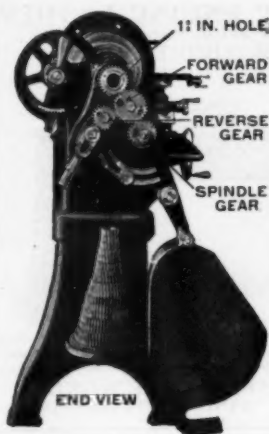
give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes**. Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

Sold by a leading Machinery Dealer in every machinery center.



THE MONARCH MACHINE TOOL CO., 106 Oak St., SIDNEY, OHIO



Barnes 18 inch Lathe

Bronze Boxes

Steel Racks

**Hole in Spindle
1 $\frac{5}{8}$ " Diameter**

**For Garage, Repair Shop and
Manufacturing Purpose**

6 ft. Bed \$625.00

8 ft. Bed \$650.00

10 ft. Bed \$675.00

Made By

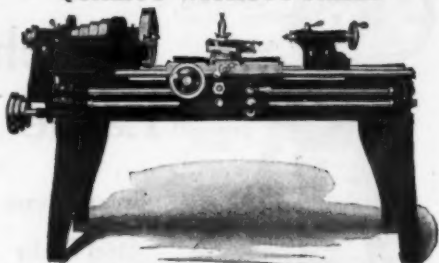
W. F. and John Barnes Co.

123 Ruby St., Rockford, Ill.

"STANDARD" ENGINE LATHES

14"-16"-18"-20" swing. Beds 6 to 16 ft.

"QUALITY WITHOUT FRILLS"



A moderate price lathe combining simplicity and accuracy with the highest grade of materials and workmanship. Suitable for repair shops, garages, manufacturing plants, etc. *Send for descriptive circular and prices.*

THE STANDARD LATHE WORKS

2951-61 Colerain Ave., CINCINNATI, OHIO, U. S. A.

"LEHMANN LATHES"

Three Step Cone—Double Back Geared and Geared Head—Single Pulley Drive or Arranged for Motor Drive

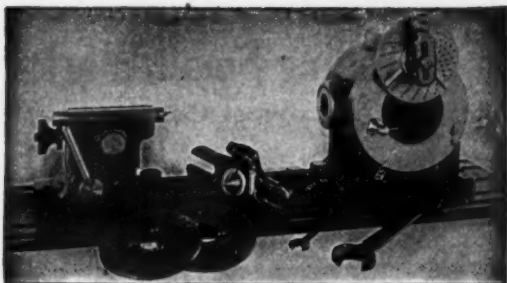


Five Sizes—14" to 24"

These are strictly high-grade engine lathes of superior design and thoroughly good workmanship and material. Built for accuracy and production.

Write for complete specifications and details. Do it today—NOW.

LEHMANN MACHINE CO., 3562 Chestnut Ave., ST. LOUIS, U. S. A.



Plain Index Centers Swing 10" Diam.

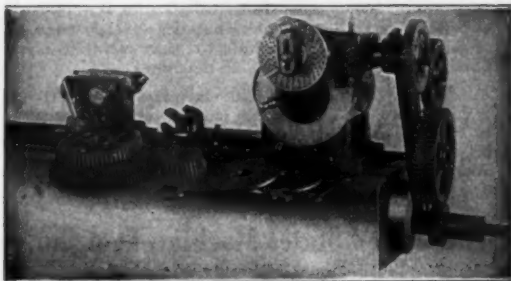
SIMMONS OF ALBANY

These Dividing Heads or Index Centers may be used on any milling machine; are well designed; materials are the finest obtainable.

The Universal Index with Spiral Cutting Attachment is a quite recent development and will be found remarkably useful in any tool-room. Let us tell you more about these accessories.

SIMMONS MACHINE CO., Inc., ALBANY, N. Y.

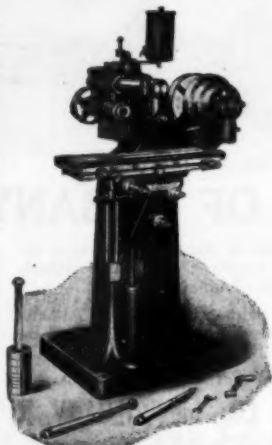
BRANCHES: 801 Singer Bldg., New York, 86-88 Exchange St., Buffalo, N. Y.
Albany and Buffalo Warehouses



Universal Index Centers with Spiral Cutting Attachments

For Milling Small Work

At Lowest Cost



No. 1
U. S.
Improved
Hand
and Weight
Feed
Milling
Machine

With its wide range and quick adaptability, and with *greater power than any similar tool of its size*, the No. 1 U. S. Improved Milling Machine handles a great variety of small work in *less time* and at a *lower cost* than is possible on large, costly milling machines.

Furnished, if desired, with Universal Milling Attachment, adapting it for die sinking, profiling, etc.; or with Plain Milling Attachment; also with a full line of accessories. Can be arranged for motor drive and oil pump attachment.

Write for specifications and full particulars

The United States Machine Tool Co.

Cincinnati, Ohio, U. S. A.

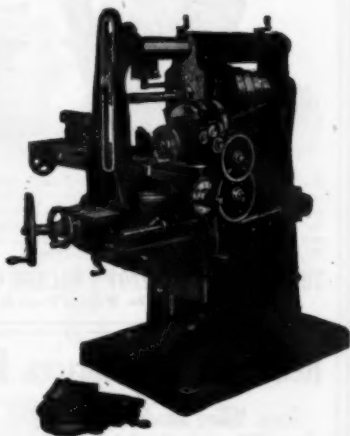
American Universal Back Geared Miller

Rugged—Rigid—Reliable

Furnished, if
desired, with

Swivel
Vertical
Milling
Attachment

For all kinds of
vertical milling

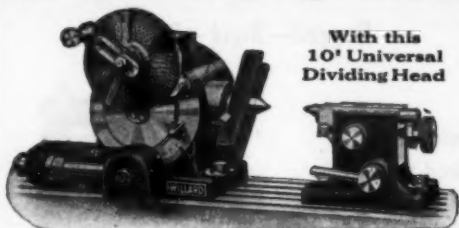


Its ruggedness enables it to take care of the heaviest strains. Wide bearings, accurate alignments, simple adjustments and ample lubrication help to explain its marked superiority. Equipped with power cross feed and power longitudinal feed. Heat treated steel gears, ground running shafts and bronze bushed bearings. Operating levers are most convenient to operator.

*Our Illustrated Folder offers full description of
this high grade miller. May we send it?*

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.

Reduce Milling Costs



With this
10' Universal
Dividing Head

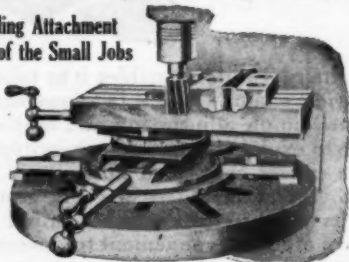
Built in very liberal proportions. Easily handles the heaviest cuts encountered on a plain miller. Graduated swivel head can be set anywhere from 10 degrees below the horizontal to 10 degrees beyond the vertical. Worm wheel and index pin are relieved of all strain by means of an efficient locking device. Write for details.

THE WILLARD-MIDDLETOWN MACHINE CO., Cincinnati, O.
Successors to The Willard Press & Tool Co.

Relieves and Replaces Big Millers

Davis Milling Attachment
Does 90% of the Small Jobs

Converts
any Drill
Press from
14 to 42-in.
swing in
2 Minutes

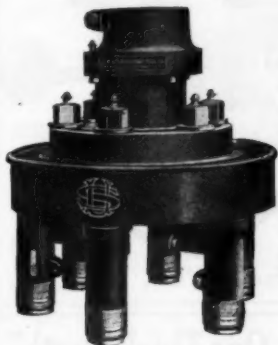


Relieves your large millers, comes in handy spotting castings, milling ends of bosses, etc., and does 90% of the lighter jobs as well as a \$1,000 machine; cuts keyseats perfectly. We also have low factory prices on our cylinder reamer for reboring the Ford car, and on our reliable air compressor. Write for the details.

Hinckley Machine Works, HINCKLEY, ILL.

U. S. Patent Adjustable
Multiple Spindle Drill Heads

Unsurpassed on Big Drilling Lay-Outs



Spindle units
quickly attached,
or removed, to suit
the work in hand.

Fixed Spindle
Heads of any
practical type made
to order.

The conspicuous feature about the U. S. Multiple Spindle Drill Head is its **PATENTED** Double Adjustment of Spindles. Not only symmetrical lay-outs, but also holes in practically every conceivable line or formation—regular or irregular—can be easily and rapidly handled.

They are so rigid and powerful that the same speeds and feeds can be used with them as is employed for drilling a single hole. This means output is increased in direct ratio to number of units attached to head.

Nos. 1, 2, 3, and 3-A have from two to six spindles. Special Adjustable Heads built to order. No. 4 has four spindles, with single adjustment, for drilling evenly spaced holes in groups of four for pipe-fittings, flanges, etc.

Send for complete specifications and prices

The United States Drill Head Co.

Cincinnati, Ohio, U. S. A.

Burke Bench Millers

**FOR
Accuracy
Convenience
Economy**

On small milling operations, where accuracy as well as production must be had, are the places to use Burke Bench Milling Machines.

Built in various sizes, both hand and power feed, and at prices ranging from \$100 to \$220.



\$220.

BURKE No. 4

**The Burke Machine Tool Co., 297 E. 16th St.
Conneaut, Ohio**

It Eliminates "That One Thick Tooth"
the Risk of



**The
RED
-
E**

The RED-E Milling Dog and Driver insures correct spacing because the ball sliding in grooved jaw compensates for the different angle in the driver at various positions of work.

Dog cannot get loose, and there is no binding, cramping or lost motion. No adjustment of dog needed for correct milling of odd pieces. In gear cutting the risk of "one thick tooth" is eliminated.

Send for complete Catalog No. H of RED-E Tools

**The Ready Tool Co.
Bridgeport, Conn.**



**Drills the
hole exactly
where you
want it —→**

—and the tilting
table with grad-
uations in de-
grees gives you
the correct angle.



The Drill Guide is only one of the many conveniences embodied in the up-to-date

Knight Milling and Drilling Machines

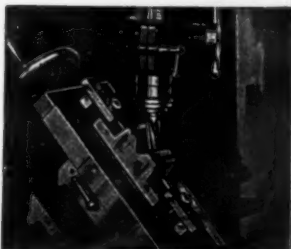
They are such wonderful economizers of time and labor in both tool room and shop, that they immediately jump into the "popular" class. Ingenious mechanics are seldom "stumped" with a hard machining job when there's a Knight to help them out. Your choice of four sizes.

W. B. Knight Machinery Co.

3920 W. Pine St.,

St. Louis, Mo.

*Unequalled
for
dies,
tools,
jigs
and
metal
patterns
of
all
kinds*



Everything in
GEARS

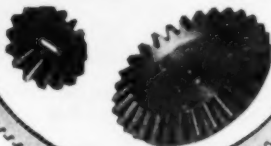
Worm Wheels, Sprockets, etc.

Get our prices

STRANAHAN GEAR CO.

17th & Wood Sts.,

Philadelphia, Pa.



**Thorofine
GEARS**

NOTHING TOO SMALL - NOTHING TOO INTRICATE



THOROFINE GEARS ARE GEARS OF EXCEP-
TIONAL ACCURACY.

LARGE GEARS

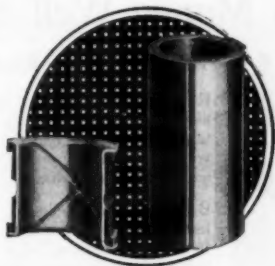
Made with the same care that has given Thoro-
fine small gears their unusual reputation. Our
Quotations will interest you. Write today.

MERKLE-KORFF GEAR CO.

Formerly Modern Tool & Stamping Co.

313 So. Clinton St.,

Chicago, Ill.



Get Them as You Need Them — We Carry the Stock for You

All the straight bushings you need can be supplied from our in-stock line of 143 different sizes just as you need them and in small lots at big production prices.

Get this list. Write for Stock Card "W."

Complete stocks at all Branches

The Bunting Brass & Bronze Co.

755 Spencer St., Toledo, O.

Bronze Bushings and Bearings—Babbitt Lined Bearings

Patented

Cored and Solid Bronze Bars



NEW YORK CITY
Grand Central Palace
Vanderbilt 7300

CLEVELAND
1362 East 6th Street
Bell-Main 5991

CHICAGO
722 S. Michigan Blvd.
Wabash 9153

SAN FRANCISCO
189 Second Street
Douglas 6245

Hush Money Well Spent



The Grant Rotary Rivet Spinner

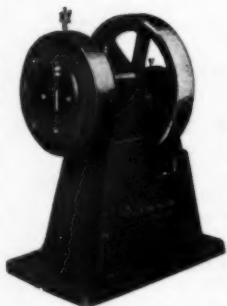
Rolls or swedges the rivet shank without noise so that when you buy a "Grant Rotary," which works smoothly and quietly without the usual nerve-racking noise, it most certainly is "hush money well spent."

But the hushing of noise is not its only big feature. It is *rapid*—one rivet a second. Its work is *uniform*, with any desired tightness or looseness. *Every head is polished*—no hammer or tool marks.

Write for Catalog, or send us a sample of your work, or both

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

500 to 1,000% Increase



Is the profitable production record of the rapid and

Powerful Etna Rotary Swager

as compared with that of the ordinary power hammer or knuckle swager.

Work can be passed thru the Etna at the rate of 10 to 20 ft. per minute, depending upon size and material.

Made in regular sizes to swage $\frac{1}{4}$ to $4\frac{1}{2}$ " diameter. Our large, illustrated Catalog shows some interesting production figures. Write for a copy.

The Etna Manufacturing Co., TOLEDO, OHIO

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

To handle rivets from the smallest, up to 1½" in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

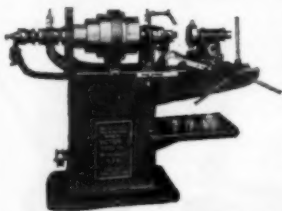
Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.
Rochester, New York

Victor Nut Facing Machine

For Rapid Facing True to Thread



Speed—The average operator faces 10 to 12 $\frac{1}{4}$ " to $\frac{3}{4}$ " nuts a minute; larger ones in proportion.

True to Thread—Facing true to thread is insured by facing nuts on a hardened threaded mandrel.

Substantial—Seldom, if ever, needs repairs. No parts ex-

posed to wear except high-speed steel cutters, which have only to be ground for proper clearance, and are cheaply replaced when worn down. Made in two sizes. Arranged for motor drive if desired. Write for complete description.

VICTOR TOOL COMPANY, - WAYNESBORO, PA.

Madison Adjustable Boring Tool

For Both Rough and Finished Boring



This new tool is quickly adjustable to size, and operates with a heavy feed.

Just the thing for cylinder boring in automobile shops.

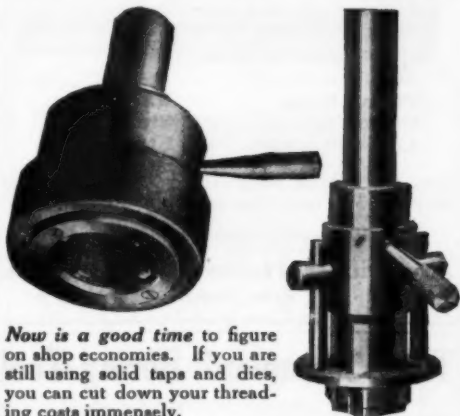
This handy Boring Tool is ruggedly built, backed by solid metal. One turn of graduated screw increases cutter diameter .025".

It can be made with a piloted bar for work requiring it. The bar can be used in any kind of boring machine where cored holes are to be machined.

A new tool you should know. Shall we describe and quote?

MADISON MANUFACTURING CO., - Muskegon, Mich.

Replace Your Solid Threading Tools With The MURCHEY



Now is a good time to figure on shop economies. If you are still using solid taps and dies, you can cut down your threading costs immensely.

Murchey Collapsing Taps and Self-Opening Dies do all the work of solid tools, but more accurately and much more rapidly and economically. When chasers are worn out, replace them with another set—balance of tool lasts for years. You can ream, face and thread without stopping to change tools.

Send blue prints of your work with trial order

Murchey Machine & Tool Co.

850 Porter Street, Detroit, Mich.

| | | | | | |
|------------------------------|---|---|---|---|--|
| NEW YORK OFFICE | - | - | - | - | 89 Warren Street |
| CLEVELAND OFFICE | - | - | - | - | 1625 Williamson Bldg. |
| PITTSBURGH Representatives, | - | - | - | - | Laughlin & Barney, 819 Wabash Bldg. |
| CHICAGO Representatives, | - | - | - | - | R. E. Ellis Engineering Co., 621 Washington Blvd. |
| LOS ANGELES Representatives, | - | - | - | - | Harron, Richard & McCone, 226 So. San Pedro St. |
| Coats Machine Tool Company, | - | - | - | - | 14 Palmer St., Westminster, London, S. W., England |
| Fenwick Freres & Company, | - | - | - | - | 8 Rue de Rocey, Paris |

Hollow Bored Forgings and Steel Shafts



**Piston Rods
Clutch Shafts
Lathe Spindles**

**Rams
Steel Pipes
Etc., Etc.**

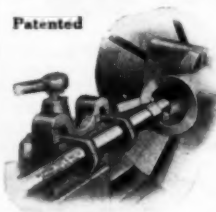
They are right in price and quality, with prompt delivery. We give "Service you can depend on."

Let us have blueprints for quotations

**American Hollow Boring Co.
Erie, Penna.**

The "Champion" Boring Tool

Patented



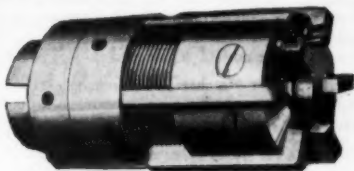
Tool consists of holder, one bar with inserted cutter with straight and 45 degree adjustment, one cutter and wrench.

Invaluable for improving and speeding up production.

Write for Catalog No. 18, illustrating the "Champion" Line of Tool Stands and other shop furniture, Tool Holders, Expanding Mandrels, Power Hack Saws, Wet Tool Grinders, Emery Wheel Dressers and Cutters, Vises, etc.

Western Tool & Mfg. Co., Springfield,
Ohio

McCrosky



McCrosky--Super Adjustable Reamers

Have six exclusive features that make them the superior adjustable reamers in design and service. Read the details on page 7 of the new No. 8 McCrosky Catalog.

We have copy for you. Send for it today

McCrosky Tool Corporation

Meadville, Pa., U. S. A.

Branches and Agencies in all principal cities

Export Agents: Benjamin Whittaker, 21 State St., New York, N. Y.

COST CUTTING TOOLS

Alert Boring and Facing Tool

High Speed Steel Blades



Made in Three Sizes

Holes 6 Inches Deep have been bored accurately in one cut. There's a reason. The Alert is used successfully on turret lathes, automatic screw machines and drill presses, for facing, counter-boring and radiusing where a fine finish is desired. Bores large holes where the cost of high-speed drills is prohibitive.

You Will Like our Ratchet Tap Wrenches, Roller Grip Arbors and Roller Grip Mandrels—all patented; also our High-Speed Solid Tap Wrenches and Hand Knurling Tool Holders.

Write for descriptive circular "H"

**Alert Tool Co., 237 N. 6th St.
Philadelphia, Pa.**

E-Z-SET Boring Tool

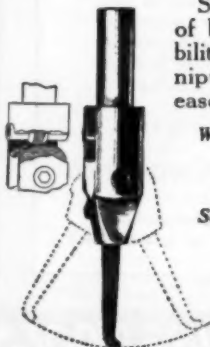
Superior to other types of boring tools in accessibility of parts, ease of manipulation, simplicity and ease of adjustment.

Write for circular and price list

4 SIZES

5/16, 3/8, 1/2, 5/8" Tool Bits

Sent on 10 days' approval



THE

B. & W. Tool & Die Co.

**102 St. Clair Ave., N. W.
CLEVELAND, O.**

Pay Only for the High-Speed Steel that CUTS

MOBACK CUTTERS

With Inserted and Adjustable Blades



Moback Face Mill
PATENTED

The first cost is less than that of solid cutters, for only the blades are high-speed steel. The frame is high-grade carbon machine steel, and all parts are ground to gauges.

The renewal cost is *only a fraction* of that of solid tools, because (1) the frame is used indefinitely, (2) the blades are adjustable for *twice the wear* of solid cutters, and (3) you get a new cutter *by simply changing the blades*.

THE MOBACK FACE MILL, shown in the illustration, is highly efficient, thoroughly dependable, and so economical that it makes the use of solid cutters a reckless extravagance.

THE MOBACK END MILL is made on the same principle, for the same excellent results. THE MOBACK SIDE MILL also has the inserted blades, and can be used in pairs, or separately, or in combination with gang cutters. All Moback Cutters *multiply the buying power of your dollar four to six fold* in the purchase of RESULTS.

May we post you fully, for ECONOMY'S sake?

Moback Tool & Machine Mfg. Co.
330 Atlantic Ave., Boston, Mass.

Coventry Chucks



The strongest on the American market as to gripping power, protection from breakage and freedom from harmful wear. All working parts enclosed to keep out dirt and keep the lubricant in. Made in sizes of 9 to 25-inch diameter.

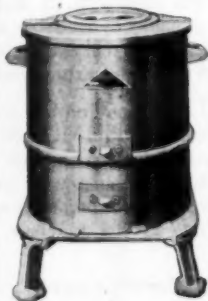
*Write
for Bulletin
No. 201*

ALFRED HERBERT Ltd.

54 Dey Street, New York

14

Reduce Tool Hardening Costs with The "Triad" Hardening Furnace



Saves 60% in Costs

Has three compartments for:

- 1 Hardening in Lead Bath.
- 2 Hardening in Semi-Muffle Furnace.
- 3 Forging in Combustion Section.

These three sections make it possible to carry on above three different operations at the same time *by one single heating unit*. It is also so perfectly constructed and improved that above three sections can be heated at a *lower* fuel cost than is required to heat the ordinary one-section furnace.

Write for Catalog No. 5

The W. R. Bennett Co., P. O. Drawer X
Elmwood, Conn.

Chucking

With a Pull of a Lever—that's all

It centers automatically and requires only the pull of a lever to hold the piece either lightly or with a most powerful grip, as the character of the work may require.

The Barker Wrenchless Chuck

is a self-contained device of extreme simplicity—no special equipment of any kind required. It turns most of the lost time between cuts into production time. On duplicate work it often *increases the output of a lathe from 30 to 150 per cent.* Sizes 6" to 16", with two or three jaws.

Thomas Elevator Co.

Chuck Division

31 S. Hoyne Ave., CHICAGO



*Write for Catalog, which fully
explains its great economies*



Straight Shank Turning Tool



Boring Tool



Straight Shank Cut-off Tool

Armstrong Tool Holders

Make One Pound
of High Speed Steel
go as far as Ten
Pounds in Forged
Tools.

Grand Prize Winners at
Panama-Pacific Exposition.

Complete Catalog Free.



Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.



Gerstner ^{Quality} Tool Cases

Made in many styles and 30 sizes,
with "quality" the prime object.
Our Guarantee—"Money re-
funded if you are not entirely
satisfied."

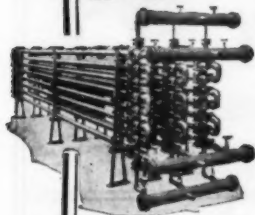
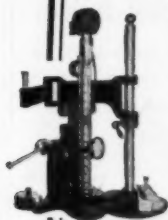
Order and Protection

A place for everything and every-
thing in its place, with protection
against rust, dirt, pilferers and
"borrowers."

Write for Catalog



H. Gerstner & Sons, 204 Columbia St.,
DAYTON, OHIO



"DOCTORS of heat-treating"—that's what we want to be to you. Whenever your department is ailing either in volume or quality of product we want to be called in.

We will justify the invitation by giving you the level best of our advice, whether you use SCH equipment or not—and regardless of whether it means a sale. Put a problem up to us as a test of our ability.

**THE
STRONG,
CARLISLE &
HAMMOND CO.**

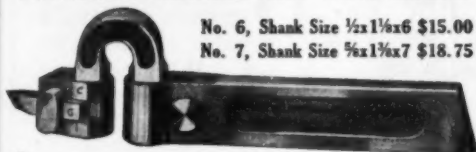
CLEVELAND, OHIO

Branches:

Boston New York Chicago
Philadelphia Detroit

**SCH INDUSTRIAL
FURNACES**

Cleveland National Spring Head Tool Holder



No. 6, Shank Size $\frac{1}{2} \times 1\frac{1}{2} \times 6$ \$15.00

No. 7, Shank Size $\frac{3}{8} \times 1\frac{1}{2} \times 7$ \$18.75

For
Broaching,
Cut-off,
Forms,
Gauges,
Keyways,
Radii,
Taps,
Worm or
Square
Threading,
Etc.



Write for
30 days'
trial offer

ALSO

Circulars
of other
Modern
Tool Room
Specialties

The Cleveland National Machine Co.

Dept. T. L., Cleveland, Ohio

One Trial Will Convince You That



The EASY-Lock Holder and Counterbore Cutter

is the most efficient tool holder now offered. No wrench, hammer or wedge required. *One twist locks cutter into holder.* Cutters are adjustable and can be used up to a third of their length. Made also to fit screw machines and turret lathes.

Folder on request

Manufacturers Machine Products Co.

1320 Mt. Elliott Ave.,

Detroit, Mich.

Make *this* case your own!



Carbonizes all kinds of steel

After you have given Ferro Case a fair trial in your shop, you will turn your back on cyanide forever. Ferro Case carbonizes at a lower temperature, thereby avoiding coarse crystallization, warping and wear of furnace linings and crucibles. With greater economy you obtain a better, cleaner, glass-hard case. Moreover

It's a Non-Poisonous Compound

scientifically prepared, which does not lose its effectiveness with age or chemical action, and can therefore be stocked freely without any danger of deterioration.

Ferro Case M is for use in the cyanide melting furnace, and is handled the same way.

Ferro Case S is for sprinkling on hot steel. In either case you get better results in absolute safety.

You will profit by making it your own case. Mail us that trial order today.

C. G. Buchanan Chemical Co.
Sta. H., Cincinnati, Ohio



NORTHERN CRANES

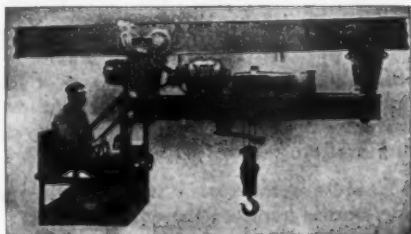
NORTHERN "D & PL"
Electric Hoists



Our Catalogs on request

NORTHERN ENGINEERING WORKS

208 Chene St., Detroit, Mich.



Euclid Hoists

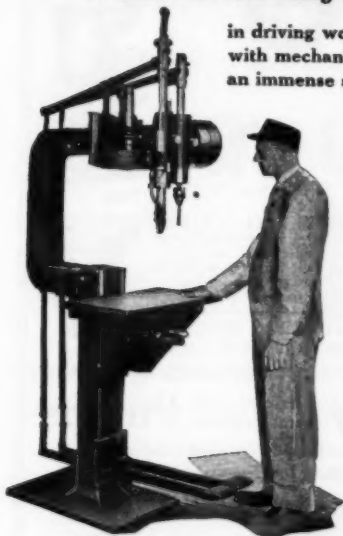
can be made a big factor in reducing your costs by speeding up material moving and cutting the pay roll.

Write for catalogue today

The Euclid Crane & Hoist Co.
EUCLID, OHIO

Profit By The Experience

Of Hundreds of Leading Manufacturers



in driving wood or machine screws
with mechanical perfection and at
an immense saving in cost

Stewart-Warner Speedometer Co.: "Our seven Reynolds Machines paid their cost in about four months."

Hoover Suction Sweeper Co.: "Workmanship far superior to hand work."

Willard Storage Battery Co.: "Our eight machines in almost every case paid for themselves in six months. Do not require expert operators."

Edison Storage Battery Co.: "Doing work of four men."

Lindsay Factories, Ltd.: "An unskilled youth does the work of six trained mechanics."

Hundreds of similar examples could be cited if we had the room.

Automatic Magazine Fed Screw Driving Machine

It is from the experience of others that we gain wisdom—otherwise we would still be living in caves. So why not fall in line and remove the handicap of excessive screw driving cost? If your competitor has these automatic magazine fed machines, meet his move. If he hasn't, beat him to it.

Tell us the dimensions over all of your work and the gauge and length of screws you are driving, and we will send you description of the machine that will best suit your requirements.

The Reynolds Machine Company

Dept. H. H.,

Massillon, Ohio



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

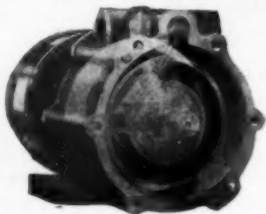
GITS BROS. MFG. CO
1940 SO. KILBOURN AVE., CHICAGO



Style "H"

Rollway Positive and Semi-Positive Pumps

Valveless—Cannot Clog—Self Priming
No Loss of Prime—Low Speeds—Large Volume



For all liquids. Particularly adapted to machine tools.

Deliver 30 per cent greater volume than other types for size of intake and outlet.

Rolling motion of pumping mechanism eliminates wear caused by scraping of parts against pump chamber.

Last longer. Best service, cheapest service, and trouble-proof.

Intakes and outlets $\frac{1}{8}$ to 2".

Capacity, 2 quarts to over 150 gallons per minute.

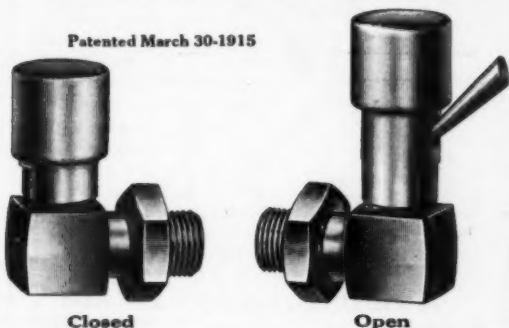
Let us solve your pumping problems. Write for literature

Michigan Machine Co., Detroit, Michigan

TUCKER'S

Dust Proof Elbow Oilers

Patented March 30-1915



For Spring Shackle Bolts or Any Other Bearing Requiring a Right Angle Oiler

No. 25 Style G cup with $\frac{1}{8}$ " pipe thread, mounted in a $\frac{1}{8}$ " pipe elbow having a straight thread lock nut to bind device to structure when in position. Elbows are made from $\frac{1}{2}$ " square Brass Rod leaving a substantial head for wrench hold for attaching. No need to use never slip pliers to distort and mar the article. Oil Port is absolutely protected from dust. Cap member can be raised with oil can spout. Cup member is round with no projections to prevent wiping with a rag before oiling. No hinge joints or wire springs exposed to the weather.

Furnished in Plain Brass or Nickel Finish

Manufactured by

W. C. & F. C. TUCKER, Hartford, Conn.

You Need Less Oil

When using a Curtis Oil Extractor



No. 400—Capacity: 2 Bushels

It helps you to make a better showing on the profit side of the ledger. The price of the machine is returned in a few months; after that the oil saved from chips, shavings and waste is pure gain. The three sizes are easily operated, sturdily built and have ball bearings.

*A Curtis reduces oil bills and expense.
Write for details and prices.*

Albert B. Curtis Estate

Box 44

:-

:-

Worcester, Mass.

DO You Use AIR?

THE POWELL
AIR GUN VALVE

JUST PRESS
THE BUTTON



BUY
POWELL
AIR GUNS
KEEP
CLEAN

CLEANS
WORK BENCHES
AND
MACHINE TOOLS
MADE IN SIZES
 $\frac{1}{8}$ " TO 1"

ORDER A SAMPLE
THE W. M. POWELL CO.
1200 DRAPER ST.
CINCINNATI, O.



Terrell's Steel Lockers

Mean
Economy
and
Modern
Efficiency

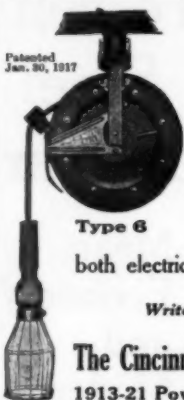
PERMANENT, FIRE-PROOF shop furnishings afford the same degree of economy and modern efficiency as permanent, fire-proof buildings.

TERRELL'S STEEL LOCKERS have the economy of permanent, fire-proof construction, and they are efficient because (1) They are sanitary; (2) They keep their contents safe from meddlers and thieves; (3) They add much to the prosperous appearance of the shop, and (4) They increase the good will of self-respecting workmen. They are made in a variety of sizes and styles, single or double tier, and adapt themselves to available spaces and meet special conditions at moderate cost.

*Write for estimate on filling your requirements
The obligation is ours to make good—not yours to buy*

Terrell's Equipment Company
Hall & Division Sts., Grand Rapids, Mich.

Patented
Jan. 30, 1917



Type 6

both electric lamp and power extensions.

"Autex" Extension Reel

Rapidly finding a place in the largest industrial plants, machine shops, service stations, etc., in the U. S. Used for

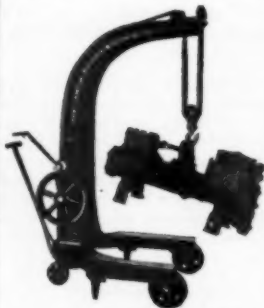
Write for descriptive circular

The Cincinnati Specialty Mfg. Co., Inc.

1913-21 Powers St.,

Cincinnati, Ohio

One Man And The Canton Crane



Replace The Labor Of 6 to 10 Men

For handling and hoisting heavy pieces, castings, motors, tools, etc., to or from any part of the shop required, it is without a rival. It can operate in corners where your overhead crane cannot reach. Many firms call it: "*The Handiest Tool in the Shop*". Often pays its cost merely in avoiding workmen's compensation claims caused thru accidents in moving heavy pieces about the shop.

*Many sizes. Write
for Booklet E-8*

Canton Foundry and Machine Co.

Canton, Ohio

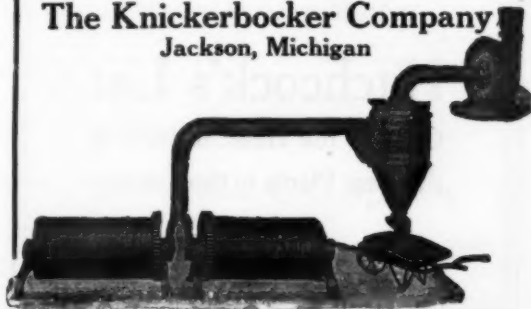


**Knickerbocker asks you
to note that the "Rarefied"
Dust Collectors have these
points of superiority:—**

- ¶ The suction never varies.
- ¶ They collect *all* the dust heavier than air.
- ¶ The material collected is discharged *automatically*.
- ¶ There is no cleaning out by hand.
- ¶ There is no filling up of cloth or screens.
- ¶ There are no moving parts.
- ¶ There is no cutting out of fan.
- ¶ The inner separating walls are interchangeable.
- ¶ There is no undue wear on Collector parts.
- ¶ The cost of repairs is very slight.

*Their superiority has made them favorites in many
big plants. Write for Booklet and list of users*

The Knickerbocker Company
Jackson, Michigan



Made in five sizes, for balancing anything that turns on a shaft, up to 10,000 lbs. weight



Improved Anderson Balancing Ways

Always ready, without adjustment, to accurately balance anything that turns on a shaft up to 10,000 lbs. Ball bearing. Sensitive.

| "Swing" | 20" | 40" | 60" | 72" | 96" |
|--|------|------|------|------|-------|
| Greatest distance between standards..... | 20" | 30" | 30" | 66" | 88" |
| Capacity in lbs..... | 1000 | 2000 | 2000 | 5000 | 10000 |
| Approx. shipping weight..... | 45 | 90 | 150 | 350 | 650 |
| Code..... | Bend | Bnd | Bis | Bib | Ben |

Any of above can be furnished with shafts extended.

Anderson Bros. Mfg. Co.
1915 Kishwaukee St., Rockford, Ill.



Hitchcock's List

Goes to the Heart of 96% of
the Best Plants in the Country

The above statement is the result of careful mail inquiries directed to thousands of the larger tool-using concerns.

Make Work A Pleasure

Use Collis Quality Tools



No. 100-D Standard Type Sleeve



No. 100 Use-Em-Up Type Sleeve

Standard and Use-Em-Up Types Drill Sleeves and Sockets

NOW is the time to put those Drills with twisted tangs or broken shanks back to work. It's easy with the

Use-Em-Up Type Socket

The Use-Em-Up Type Socket is the only positive drive for Drills, Reamers, etc. Put those Drills with twisted tangs and broken shanks back to work. Just grind a flat on the remaining portion of the shank (time two minutes) and they will do more and better work than when new. The Use-Em-Up drive enables you to speed up your machine and take heavier cuts. As long as there is three-fourths of an inch of the shank left, it can be used in a Use-Em-Up Type Socket.

The Collis Company

MANUFACTURERS

Clinton

- - - -

Iowa

Send for Our General Catalogue

COOPER UNIVERSAL JOINTS FLEXIBLE COUPLINGS

"YOU CAN'T BREAK THEM OR WEAR THEM OUT"

Smooth; neat; only 5 simple parts; large oil space;
working surfaces case-hardened; no limit to size;
guaranteed stronger than shaft at any angle.

6 PATENTS



Three hundred years ago Hooke invented the Universal Joint with fixed centers. Three hundred years have elapsed and still the Hooke type of universal joints are burning up power and breaking in operation.

The Cooper Patented Universal Joint with no fixed centers is just as frictionless as the crosshead of an engine at any angle. *"You can't break them or wear them out"* with shafts joints are bored for. Perfect lubrication at any speed.

Sizes $\frac{1}{4}$ " to 2" in stock bored to fit YOUR shafts.

Send for one and try it out

Cooper Flexible Transmission Co., Inc.
1723 8th Ave., Brooklyn, N. Y.

Time-Tested Universal Joints



The "Giant"

Efficient to
an angle of
45 Degrees

Vanderbeek
Universal
Ball Joints
for higher
angle drives

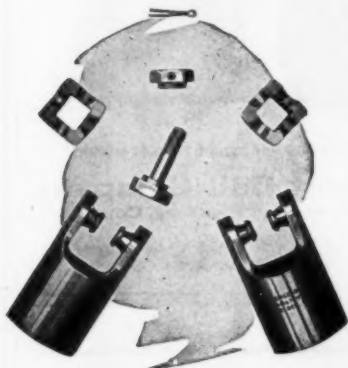
Sizes $\frac{1}{2}$, $\frac{3}{4}$, 1 , $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 , $2\frac{1}{2}$ and 3 in.

Tested by time, they have proven dependable on all kinds of heavy, fast machines. Wearing contacts are hardened steel; stem ends are strong and well braced. Self-oiling and dirt-proof—just put them on and they take care of themselves. *Complete data upon request.*

Ainslie Machine & Tool Works

Successors to Vanderbeek Tool Works
HARTFORD, CONN.

Let Us Solve Your
Universal Joint Problems
As We Have For Others



One large manufacturer gave us an order for **\$17,000** worth of **Borgeson Universal Joints** after testing them with 65 other makes under maximum strain

Sizes $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2 & $2\frac{1}{2}$ inch

They have great torsional strength.

The construction is simple and scientific.

No pivotal floating pins or parts to work loose.

The yokes are ground concentric with the bearing pins and run true with each other.

Of the 15,000 Borgeson Joints sold last year we were not asked for a single replacement.

Write for price list and more complete information. We believe we can solve your Universal Joint problems to your entire satisfaction if given the opportunity.

The Borgeson Manufacturing Co., Inc.
Torrington, Conn.

Abbott Steel Bearing Balls

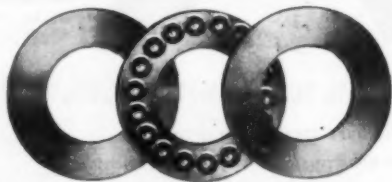
High Grade—Highly Finished



We shall be glad to have your inquiries and make estimates

The Abbott Ball Company

Elmwood District, Hartford, Conn.



GWILLIAM THRUST BEARINGS

*Flat or Grooved Races
from 1/4" Shaft Dia., Up*

ONE BEARING—OR ONE THOUSAND

THE GWILLIAM COMPANY

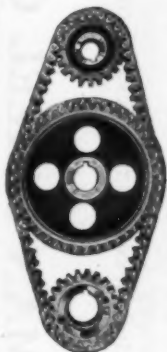
23 FLATBUSH AVE., BROOKLYN, N. Y.

OVER 50,000 MILES
NOW REPORTED ON

“WHITNEY”

High Efficiency

FRONT END
MOTOR CHAIN DRIVES.
AND STILL IN GOOD CONDITION



Not one of these
chains has been
known to skip a
sprocket tooth.

Chains having a
high mileage save
inconvenience
and frequent re-
placement ex-
pense.



The Whitney Mfg. Co.
HARTFORD, CONN.

CULLMAN SPROCKETS

STOCK AND TO ORDER



Diamond, Whitney, Baldwin, Duckworth and
Coventry Chains, Block, Roller and
High Speed Silent types on hand



CATALOG

CULLMAN WHEEL CO.,
1359 ALTGELD STREET

CHICAGO

GRIND IT On a BLOUNT

20" Wet Tool Grinder



Catalog on request

Blount Wet Tool Grinders are built in three sizes for 14", 20" and 30" Grinding Wheels respectively.

J. G. BLOUNT CO., Everett 49, Mass.

Ott Grinders

Combine the essentials of
ACCURACY and **RIGIDITY**
with **SIMPLICITY** of design

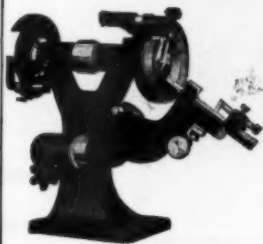
Simplicity accounts for their price, and for
their popularity among good operators.

5"x18" Plain—10"x32" Universal—6"x6" Internal

Ott Grinder Company

200 West Tenth St., Indianapolis, Ind.

Keep Up Your Tools
Keep Down Your Costs



with

Grand Rapids
Drill Grinders
Tap Grinders
Universal Grinders

which

Give Perfect Results

Catalog on Request

Grand Rapids Grinding Machine Co.

17 Ottawa Ave., N. W., Grand Rapids, Mich.



Greenfield
TRADE MARK REG. U. S. PAT. OFFICE

No. 2 Universal

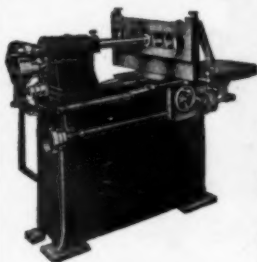
A VERSATILE GRINDER. Head swivels on Standard. Standard swivels on Base. Slides turn *with* Standard, not around it.

A substantial, well built grinder equipped with a large assortment of convenient attachments designed for handling a wide variety of work.

Ask for particulars

Greenfield Machine Company
Greenfield, Mass., U. S. A.

For regrounding tractor, truck
and automobile engine cylinders



SCHMIDT Internal Grinder

For regrounding all makes and
sizes of cylinders and cylinder
blocks.

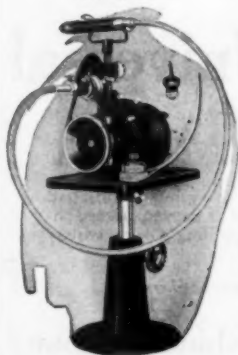
Regrinds six Ford blocks in a
day—larger cylinders in propor-
tion.

This simple, rugged, depend-
able and highly efficient machine
is indispensable for automobile
and tractor repair shops.

Let us post you on this money-earning tool

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.

Type M 2



We build them

Strand
TRADE MARK

The STRAND

**Flexible Shafts
And Equipments**

are well known all over the
world for their peerless effi-
ciency in shops where
metal is used.

Made in several sizes

N. A. Strand & Co.
Machinery Hall
Chicago

Reid No. 2 Surface Grinder

A Precision Tool of Highest Practical Value

Grinds
18" Long
6" wide
11½" High

And don't
fail to
ask us
about the

Reid
Universal
Angle
Fixture



Not only is this machine exceptionally rigid, with a true-running wheel and the closest adjustments, but experience and care have enabled us to make those features as nearly permanent as is humanly possible.

All castings, made of clean gray iron, are roughed and seasoned, then finished and scraped to master plates—they are permanently set.

The spindle, which is hardened, ground and lapped, runs in phosphor bronze boxes, with adjustments for wear and end play.

A compact spring curtain renders wearing surfaces impregnable to dust—prevents accumulation of dirt and grit—extremely important in practical operation.

Write for description of this rigid, productive grinder

Reid Bros. Co. 59 Park St.
Beverly, Mass.

Export Department, 77 Broad St., New York City
English Agents, Oliver Machinery Co., Ltd., 201-03 Deansgate, Manchester, Eng.

No. 190 "WELLS" Universal Cutter and Reamer Grinder

Will handle practically
all grinding require-
ments of the small shop
at a moderate cost.

*Write for descriptive
data sheet*

MACHINE TOOL DIVISION



GREENFIELD, MASS.



HMT 438



CLOUGH REAMERS

Style B Reamer, shown in cut, has all-steel blades of either carbon or high-speed steel. Made in sizes $\frac{3}{4}$ " to 6". Sizes 1" to 6" kept in stock. Also three other styles of high-grade Machine Reamers, as well as Expanding Hand Reamers of superior quality.



Counterbores

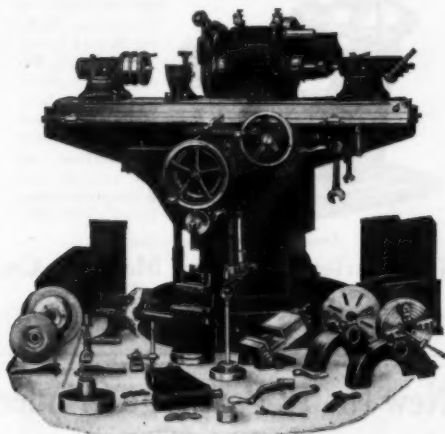
DO NOT use dull tools when this Counterbore can be sharpened as easily as a twist drill. Has removable center.

You should have our Small Tool Catalog. Your address?

R. M. CLOUGH, Meriden, Conn.

Thompson 10x36 Universal Grinder

For ALL Grinding Operations



Whether it is plain grinding for straight or taper work between centers, surface grinding, edge grinding, die grinding, cutter or internal grinding, the Thompson Universal does any or all of it easily, accurately and economically. The grinding wheel is in a fixed position—an exclusive feature, while the table carrying the work is adjustable to any desired position relative to the wheel. It is a Universal Grinder with the efficiency of specialized machines.

Write for specifications and descriptive folder, which clearly illustrates the various grinding operations

OUR SELLING REPRESENTATIVES:—

Notch & Merryweather Mch. Co.,
Cleveland, Ohio
Manning, Maxwell & Moore, Inc.,
New York, Philadelphia, Pittsburgh,
Buffalo, Cincinnati,
St. Louis, Seattle
Hill, Clarke & Co.,
Boston, Mass.
Kemp Machinery Co.,
Baltimore, Md.

Riverside Machinery Depot, Detroit, Mich.
Corbitt-Kirkby Mch. & Sup. Co., Toledo, O.
Wayne Mch. Co., Ft. Wayne, Ind.
Dayton, Ohio
Hill, Clarke & Co.,
F. E. Satterlee Co., Minneapolis, Minn.
F. O. Stallman Supply Co., San Francisco,
Los Angeles, Calif.

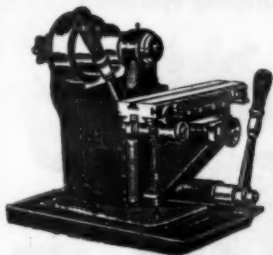
FOREIGN:

Bevan & Edwards Pty., Ltd.,
Melbourne, Sydney

Selson Engineering Co., London, Belgium,
France, Italy

THE THOMPSON GRINDER CO., Springfield, Ohio

Just The Machine



for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for descriptive circular

The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

New No. 12 Partridge Grinder



—With Guards

Also Bench,
Column and
Cabinet Grinders;
Polishing Lathes;
Light Punch
Presses;
Hollow Mills;
Countershafts;
Bench Tapping
Machines and
Saw Mandrels.

E. O. PARTRIDGE, 2041-2049 W. Lake St., CHICAGO

**How Would You Like To
Get Away From
Diamond Expense?**

Then Ask Us About

The Precision Truing Machine

**A Device for Truing and
Dressing Grinding Wheels**



Can Be Applied To Any Cylindrical Grinder

Ask for Circular H-7

The Precision Truing Machine & Tool Co.
Cincinnati, Ohio

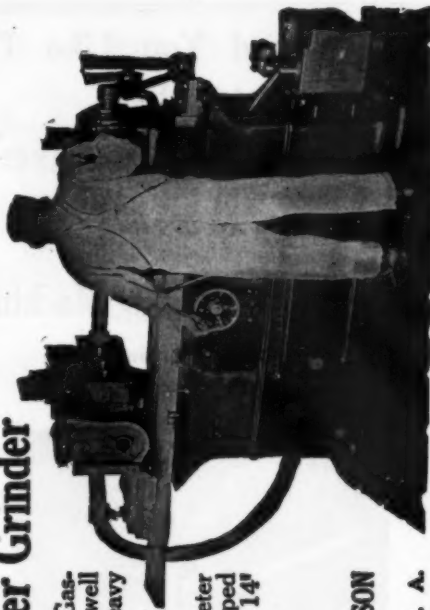
Whitney Cylinder Grinder

For grinding all kinds of Gasoline Engine Cylinders as well as work too large or too heavy to revolve.

Machines furnished to grind holes from 3" up to 7" diameter and 14" deep. Also equipped to grind holes as large as 14" diameter and 20" deep.

Write for new catalog

BAXTER D. WHITNEY & SON
Incorporated
WINCHENDON, MASS., U. S. A.



Miller Radius and Angle Grinding Wheel Dresser

Eliminates Guesswork



The MILLER is the latest modern type of Grinding Wheel Dresser and insures the quick and accurate dressing of curved, beveled and irregular shaped faces on grinding wheels. This has long been a serious problem and has involved a considerable loss of time, labor and money.

Forms radii from 0" to 1 1/4" concave or convex. Also dresses any angle or form desired. Grinds wheels up to 12" in diameter. Tool post has three splines, so the diamond may be set at right angles with travel of the side for dressing angles. Also has 2" centre height adjustment. Distance from measuring post to pivot centre is 3", and simple addition or subtraction gives the exact concave or convex required, cutting out guesswork and ALL past wasteful methods.

For economy and improved output it is unrivaled

Otto A. Miller & Sons

408 Moffat Bldg., Detroit, Mich., U. S. A.

DETROIT CENTERLESS GRINDERS

For grinding straight cylindrical work without the use of centers



Grinds in rows *continuously*, greatly increasing production.

Feeds *straight* thru guide blocks, and pieces rotate slowly, insuring work that is *round and perfect*. Grinding surface of wheel over 200 square inches.

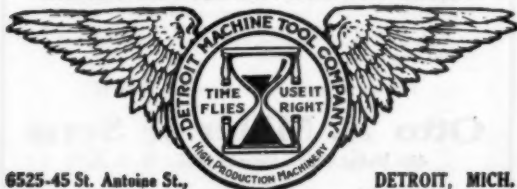
Capacity, $\frac{1}{8}$ " (and smaller) to $1\frac{1}{4}$ " diameter, in various lengths.

Figure out your production

The complete Production Table, shown in our literature, enables you to figure production time on all diameters. The following sample figures show four diameters only:

| Diameter | Length | Ft. of Pins per hour | Pos. per hour |
|---------------------------------|----------------|-------------------------|------------------|
| $1\frac{1}{4}$ 1.250-1.249..... | 4 | 20 | 60 |
| 1 1.000-0.999..... | $3\frac{3}{4}$ | 22 | 70 |
| $\frac{3}{4}$ 0.750-0.749..... | $3\frac{1}{2}$ | 24 | 82 |
| $\frac{1}{2}$ 0.500-0.499..... | 2 | 28 | 168 |

Let us grind 25 samples free; and write for description



6525-45 St. Antoine St.,

DETROIT, MICH.

Two Great Cost Reducers

Manhattan Massive Surface Grinder



Compact, yet so rugged and rigid that it has no chatter whatever. Body casting affords most clearance where it is most required. Graduated dials on vertical and transverse feeds are graduated in thousandths of an inch. Spindle without overhang at wheel, end runs in extra large phosphor bronze bearings, insuring increased capacity for heavy cuts. It is *silent, precise and powerful.*

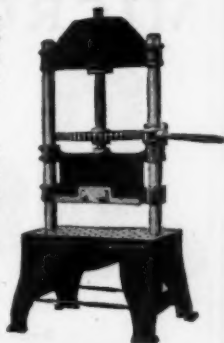
Hand Screw Press for Die Makers

Unlike ordinary punch power presses which require two or more men to handle them in die making operations, this MANHATTAN is a *strictly one-man machine.*

It also insures perfect alignment of punch and die, which cannot be always obtained with a punch press costing *ten times as much.*

Unsurpassed for rapid and accurate die making.

Guaranteed up to 80,000 lbs. pressure.



Send for full description of these economy machines

Manhattan Machine & Tool Works
Dept. A., Grand Rapids, Mich.



Hartford Taper Gage

The Tool That Detects All Taper Inaccuracies

Simply place this tool on the floor or on a bench—whichever is the more convenient—and adjust it to your height.

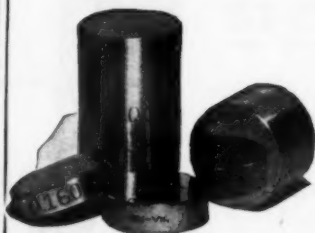
When you have put your taper in the gage, you can tell at a glance, by means of the light from a window or an incandescent light, just where are any inaccuracies, down to less than 1-1000 of an inch.

This gage is adjustable over a wide range—from No. 0 to No. 14 B. & S. taper—so it will undoubtedly fit any tapers that you have.

*One concern had one and ordered 32 more.
Write for complete details of this time-saver.*

Hartford Special Machinery Co.
285 Homestead Ave., Hartford, Conn.

MICROGAGES PAY 500%



Van Keuren Microgages.

The Individual
Set \$ 7.50
The Shop Set..... 50.00

They are wonderful tools that surpass the expectations of everyone.

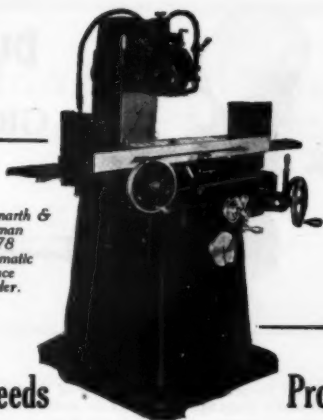
Write for Circular 33

Light Wave
Measuring
Outfits

THE VAN KEUREN CO.
362 Cambridge St., Allston, BOSTON, MASS.

Modern
Measuring
Tools

*Wilmarth &
Morman
No. 78
Automatic
Surface
Grinder.*



Speeds

Production

The No. 78, pictured above, is built for Precision Work, with reserve rigidity and strength to take .050 to .070 of an inch cut when desired.

This surface grinder is very heavily constructed to eliminate vibration and its resulting chatter, and can be ordered in either Wet or Dry design. The No. 78 is adaptable for gauge and tool work and each machine is equipped with a diamond wheel-truing device, permanently and conveniently attached for instant use.

*Check your files and see if
you have our latest catalog*

Wilmarth & Morman Co.

Master Grinder Makers

1185 Monroe Ave., N. W., Grand Rapids, Mich., U. S. A.



THE Wood Turret Machine Company of Brazil, Indiana, uses the DUMORE High Speed Grinder in many ways which readily show its real merit—in grinding the head of the Wood Turret Lathes for example, and in finishing spindle ends, etc.—the high speed of the DUMORE giving a result much superior to that obtained from slow speed grinders.

Here is a tool in which perfect running balance is combined with correct cutting speed. With a DUMORE in the shop there is no costly tearing down of jobs—no wasteful delay. It is set up easily and quickly wherever it is needed. The DUMORE can solve your grinding problems. It is the only tool on which you may surely rely for speed and accuracy.

Your dealer sells DUMORE Grinders
Ask him for a demonstration

WISCONSIN ELECTRIC COMPANY
4329 Sixteenth Street, RACINE, WISCONSIN

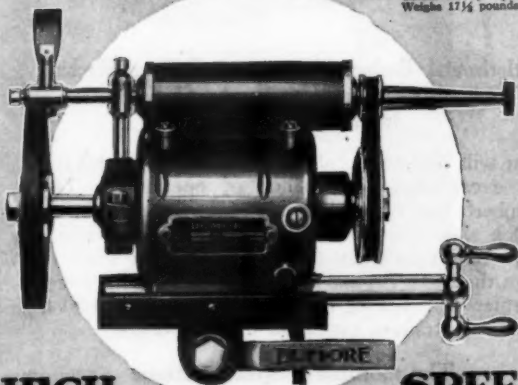
DUMORE

RE
ER

Machine Tool Builders Use the **DUMORE**

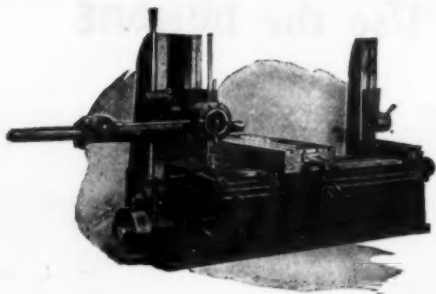
EQUIPMENT A

For general tool room use.
Includes High Speed In-
ternal Spindle A with reach
of 3 inches. 30,000 R.P.M.
Comes fully equipped.
Weighs 17¼ pounds.



HIGH SPEED GRINDERS

High Quality and Unusual Efficiency—*that's the Lambert*



**A Horizontal Boring, Milling and Drilling Machine
that's as Accurate as Human Skill and
Ingenuity can make it**

You will like and profit by its great simplicity and the exceptional convenience of operation. The Lambert has two adjustable start-and-stop levers which slide along the horizontal bars—one starts, stops or reverses any feed, and the other starts or stops the bar. Bronze bushings and all-steel gearing. Verniers for making head and outer support adjustments. Arranged for motor drive on order.

The Complete Specifications

are interesting and instructive. Glad to mail them to you, as we're sure you will be glad to read them. Let's have your name and address today.

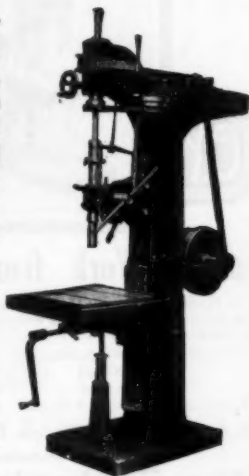
Carroll Foundry & Machine Tool Co.
Bucyrus, Ohio, U. S. A.

Avey No. 3

Heavy Duty Ball Bearing Drilling Machine

Designed for quantity and quality production on all classes of drilling. Much higher speeds can be obtained than ordinarily used for holes from $\frac{3}{4}$ in. to $1\frac{1}{8}$ in., which, combined with finer feeds, make a production increase of from 25 to 50% possible.

Built in combinations of one to six spindles with plain hand or power feed. Ball bearings throughout.



Our No. 3 machine provides maximum speeds for work up to $1\frac{1}{8}$ "

Write for Bulletin containing details

The Avey Drilling Machine Co.
Cincinnati, Ohio



Accurate Work from a Heavy Drill

The Rockford Mechanic's Drill is a heavy machine built to stand the strain of continuous accurate service. It has a wide range of speeds and feeds that adapts it to any kind of job going through the shop.

These are its dependable features:

**Sliding Head
Back Geared**

**Positive Feed
Automatic Stop**

There is more to the story of this drill. Write us for further details.

Made by the Rockford Machine Tool Company, Rockford, Ill.

Distributed by

The Fairbanks Company

Administrative Offices, NEW YORK

Branch Houses

Albany
Baltimore
Birmingham
Boston

Bridgeport
Buffalo
Chicago
Hartford

Newark
New Orleans
New York
Paterson
Philadelphia

Providence
Rochester
Scranton
St. Louis

Syracuse
Washington
Havana
Kingston

The
FAIRBANKS
Rockford Machine Tool Company, Rockford, Ill. Agents for the sale of all kinds of machinery, tools, and equipment. Also, for the repair and maintenance of all kinds of machinery, tools, and equipment.
Company





Three Sizes
1 to 8 Spindles

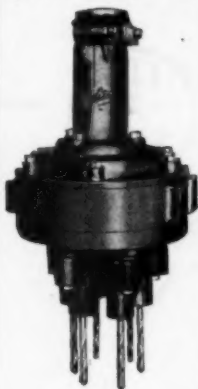
Economy's Ally—

Waste motion wastes money; convenience saves it. One of the most convenient machines on the market is the Sipp Quick Change Speed Sensitive Drill Press on which all moves are made from natural position; speed changes are made in two seconds, change of belts in ten. All transmission gears, ball bearings, etc., run in oil baths and require no attention for months at a time.

Write for complete description

The Sipp Machine Company
Keen Street, PATERSON, N. J.

**Make a Multiple Spindle Drilling Machine out
of your Single Spindle Drill Press at small cost**



The Buhr Multiple Spindle Drill Head

With 3 to 12 Spindles

Sets-ups can be made for circular, square, rectangular or staggered positions, and a complete pattern drilled in a single operation.

Insures absolute duplication or interchangeability of patterns.

The "Buhr" is as economical for drilling holes in heavy stock as the punch press is on thin metals.

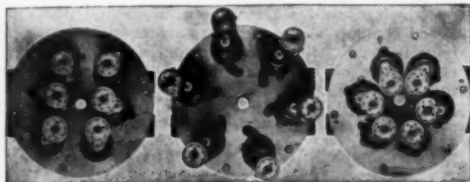
Saves in drilling time; saves shifting the piece, which usually takes more time than the actual drilling; saves

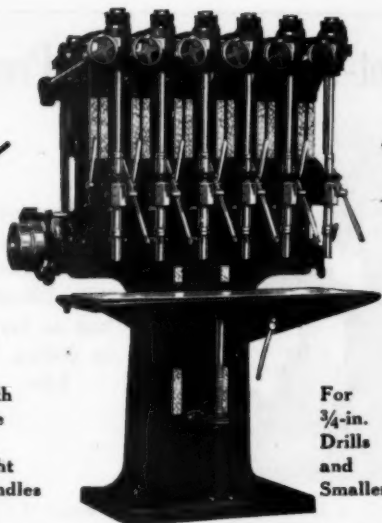
in first cost; saves in operating cost; saves in floor space. In fact, it affords such a big economy that you lose money every day you delay its installation. So why not now?

Just say the word, and we'll post you without obligation

Nelson-Blanck Mfg. Co.
Detroit, Mich.

New York Office: Grand Central Palace





With
One
to
Eight
Spindles

For
 $\frac{3}{4}$ -in.
Drills
and
Smaller

H. & W. Drilling Economy

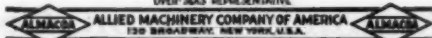
A few per cent saved in production costs means a few per cent more on the right side of the ledger. Henry & Wrights economize only on sensitive drilling, but there they have fairly revolutionized costs. A gearless power transmission with frictionless bearings and our scientific Feed and Speed Chart are both factors.

The Catalog tells the whole story; write for it

The Henry & Wright Mfg. Co.
760 Windsor St., Hartford, Conn.

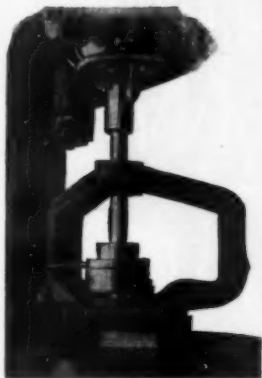
New York Office, 136 Cedar St.

OVER-SEAS REPRESENTATIVE



Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

Spot-Facing on a Drill Press



A Mummert-Dixon Facing Head makes this difficult task as easy as drilling a hole

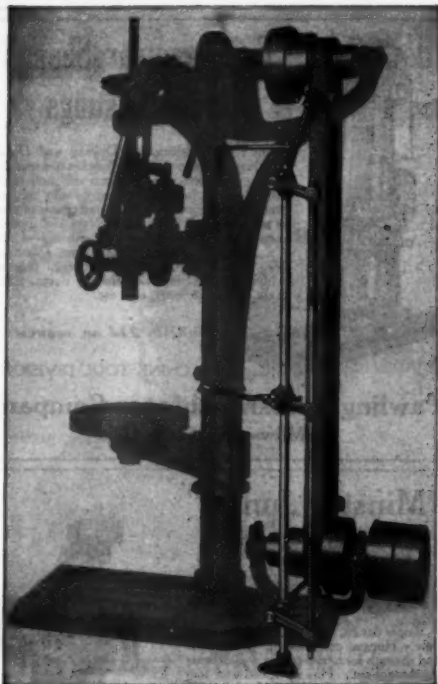
It often is necessary to face a spot or boss and drill a hole in it, which is not uncommonly accomplished by using two machines. This requires two settings and nice workmanship to make a good job.

With the Mummert-Dixon Facing Head, you use only one machine, your drill press, and one setting for both operations. Isn't that quicker, and cheaper, and better?

That is only one way in which these facing heads save time and cost. They operate on lathes, milling machines, boring machines, any tool that has a spindle or will drive a bar, doing many things easily and quickly that by other methods are difficult and slow.

We have illustrations of different applications of these facing heads which we know will interest you. May we have your permission to send them?

Mummert-Dixon Co.
HANOVER, PA.

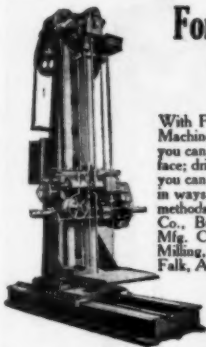


Instant changes of speed for
drill presses increase production
and reduce compensation to injured
employees.

Details in Circular H-D

The Kremer-Cummins Machine Company

1833-35 East 55th St., Cleveland, Ohio



For Irregular Shaped Large Castings

With P & H Horizontal Drilling and Boring Machines you can drill 4, 6, 8 inches horizontally; you can drill and face; you can drill and back-face; drill and bore on long and bulky sections; you can save money and do some classes of work in ways you will find far in advance of average methods. Used all over the country—Crane Co., Bucyrus, Hanna Engineering, Goodman Mfg. Co., Worthington, Nordberg, Ingersoll Milling, Illinois Steel, Obenberger Forge, Elms, Falk, Allis-Chalmers, etc., etc.

Bulletin 214 on request.

MACHINE TOOL DIVISION

Pawling & Harnischfeger Company
in Milwaukee Since 1884

"Minster Junior"

Especially designed for
shops requiring a

Large Production

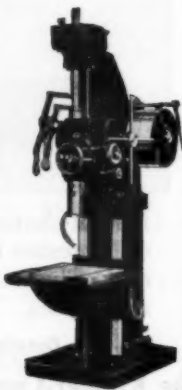
A simple design, with as few parts as possible. Rugged construction, with power and strength for heavy boring. Ball bearing throughout. Has six speed and four feed changes, and change of gears will provide any speeds and feeds. Tapping attachment, compound table and adjustable motor base if desired.

These are only a few features of this excellent drilling machine—a tool you should not overlook.

Just say "Send Bulletin 30."

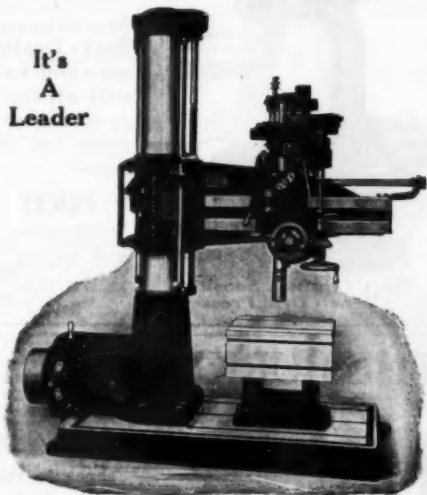
MACHINE TOOL DEPT.

Minster Machine Co.
Minster, Ohio



You can depend on the Mueller Radial Drill to reduce costs

**It's
A
Leader**



The Only Radial Drill—

that is equipped with a simple, easy to manipulate, combination **POSITIVE** and **FRICTION FEED**. This feed has proven its worth, and is distinctive like all other units of the **MUELLER** radial drill.

You should not be without a MUELLER radial drill

The Mueller Machine Tool Company

Radial Drills and Lathes.

ESTABLISHED 1902.

CINCINNATI, O.



**No. 1 Ten Inch Sensitive
Bench Drill Press**

Burke Quality Excels on Fine Points

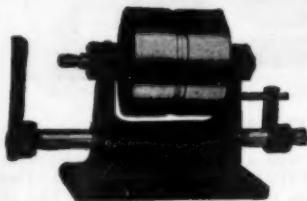
Machines of
Burke Quality
are never built
with any name
cast on the
frame but our
own—

PRICES

| | |
|----------------|---------------|
| Without swing- | |
| ing table..... | \$24. |
| With swinging | |
| table..... | \$28. |
| Motor Driven | |
| | \$65 to \$85. |

THE BURKE

**Friction Driven
Tapping Machines**



**Eliminate all
shock to the
tap and save
95% of your
tap breakage**

The most efficient machines made for work within their capacity. They are complete in themselves, yet cost less than the average tapping attachment.

*Send us samples or drawings of your tapping
jobs and let us give you production estimate*

The Burke Machine Tool Co.
297 East 16th St., Conneaut, Ohio

Model "E-50"

Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Standard speeds 2,100 and 6,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", and will take work up to $4\frac{3}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

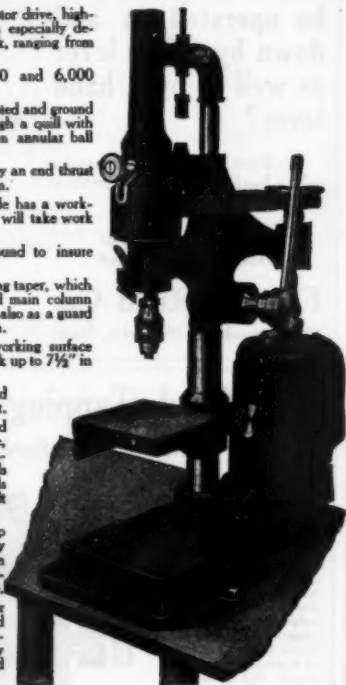
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.



Height over all.....24"
Base..... $7\frac{1}{2}$ " x 16"
Diameter of spindle..... $7/16$ "

Spindle feed..... $2\frac{1}{4}$ "
Weight.....62 lbs.
Will drill to center of a 6" circle.

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

**Would you like a drill
that the spindle can
be operated up and
down by a foot lever
as well as by a hand
lever?**

A Foot Lever is very handy
when boring wood, hard rubber
or hard fibre.

*Send for a circular of
this Drill if interested*

Francis Reed Co.

43 Hammond St., Worcester, Mass.



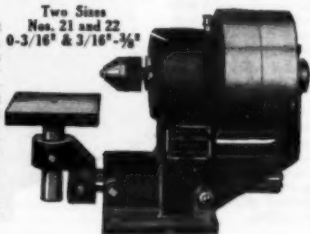
High Grade Tapping Machine

At a price you can afford to pay

Here is a machine that
will do your work, won't bother you with
break downs and re-
pairs, that your oper-
ators will like, and that
you will like because it
will give you produc-
tion accuracy and a low
installation and oper-
ating cost. Cannot give
details in this space, but
let us send them to you.
You'll find it worth
while.

Two Sizes
Nos. 21 and 22

0-3/16" & 3/16"-3/8"

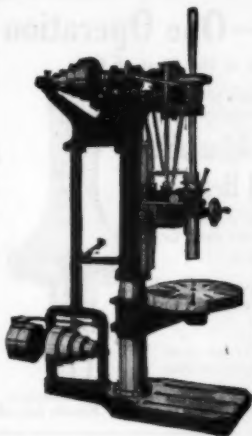


Your Address will bring them

Bicknell-Thomas Company

90 Wells Street,

Greenfield, Mass.



C-O 25" Sliding Head Drilling Machine

Back gear, quick change, positive feed; the sliding head well counterbalanced and is raised and lowered by rack and pinion; featuring seven feeds per revolution of spindle from .003 to .095; height, 84"; greatest distance spindle to table, 37", and to base, 50"; drills to center 25" circle; capacity, 0 to 2 1/4"; head travel 20"; spindle travel 11 1/4"; table travel, 19". Net weight, 1570 lbs.

Machinery that Increases Production

In every leading machine shop in the country the blue ribbon of quality is considered due Canedy-Otto machinery.

Every tool that bears the Canedy-Otto trademark is built to increase production, to do its job with the greatest speed consistent with good work.

The Canedy-Otto line is most economical in operation and longest lived. There is real experience built into every tool and considering the quality, the price is unusually low.

Canedy-Otto Mfg. Co.

Builders of Automotive Blacksmith and Machine Shop Equipment

Dept. HMT

Chicago Heights, Ill.

Three Holes—One Operation

Or Three Holes at the Cost of One



The saving is so evident
that the installation of

Sellew Adjustable Drill Heads

should be a matter of
course wherever they
can be used.

Also Special Drill
Heads with fixed spin-
dles.

*Write us freely about
your multiple drilling*



SELLEW MACHINE TOOL CO., Pawtucket,
Rhode Island

What the Turret Lathe is
to the Common Lathe, the

Turner Turret

is to the Drill Press

Regularly built with 4 to 6 spindles,
also to order. Each spindle carries a
different tool, which successively and
automatically registers in precisely the
same position. A tremendous cost
reducer.

*Write for Bulletin FH
and send sketch of your work*



Turner Machine Company
DANBURY, CONN.



STOP A MINUTE

Take a good look at the illustration above. It's a 20-inch Drilling Machine.

That Back Column is a sure cure for all the drilling machine troubles you've had to put up with in the past. We want to tell you all about that Back Column and some other vitally important features of this Super-Drill. We know your name. It's "Interested in Greater Production at Less Cost", but what's your address? Here's ours:



FRONTIER MACHINE TOOL CO., Inc.
128 LAKE VIEW AVE., **BUFFALO, N. Y.**

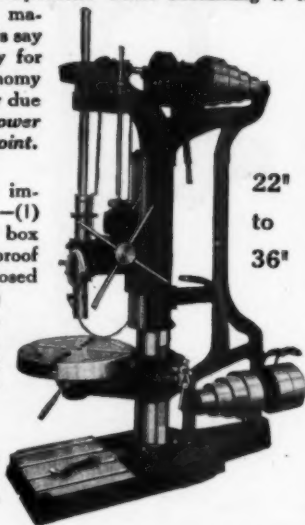
The "AURORA" Drill

Unrivalled For 100% Economy Output

Its unusually large pulley diameter and the ratio of its gearing explain its great pulling power at the drill point. This distinctive improvement gives it a clear lead over all competitors. After submitting it to strenuous tests, machine tool experts say that its capacity for maximum economy output is largely due to its *pulling power at the drill point.*

Other exclusive improvements are:—(1) Centralized feed box control; (2) Fool-proof table; (3) Enclosed positive gears; (4) Automatic release worm-wheel; (5) Patent Tapping Attachment.

Its superior PULL is only equalled by its CLOSE PRICE.



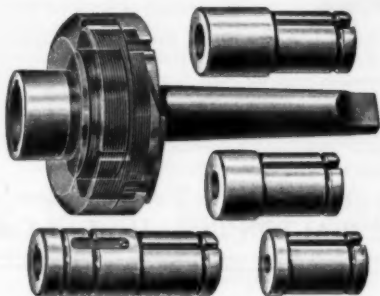
Without obligation, send for full description and price

The Aurora Tool Works

Aurora, Indiana, U. S. A.

The Safety Friction Driven Drill and Tap Holder

**Saves Taps and Affords
Perfect Tapping**



It amply justifies its name "SAFETY," because it will allow you to drive the tap at full speed to bottom of hole without risk of breaking. Whenever it clinches or holds, it instantly stops automatically while spindle continues to revolve.

Without stopping spindle you can change from drilling to tapping, or vice versa, easily and quickly.

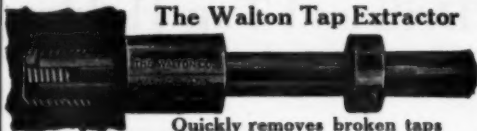
It is the perfect embodiment of simplicity, efficiency and reliability. Four sizes, 0 to 2½".

*Give it a try-out on your toughest tapping
job—that'll satisfy you.*

The Beaman & Smith Co.
Providence, Rhode Island

Why Not Laugh At Tap Breakage?

The Walton Tap Extractor



Quickly removes broken taps

Of all the minor shop accidents, that of taps breaking at or below the surface is one of the most troublesome, on account of its comparative frequency, with loss of time and often injury to the work.

Why not order a Walton Extractor NOW and laugh at tap breakage? Once used, it becomes indispensable. It pays for itself over and over again—often the first time used.

Sizes No. 8 to 1 1/4". Let us describe and quote.

THE WALTON CO., Hartford, Conn.

Weigel Double-Wheel "Trukaster"

Has heavy plates and axles. Easiest running, strongest and most durable double-wheel caster made. Lasts three times as long as others.

"Kwality Kaster"

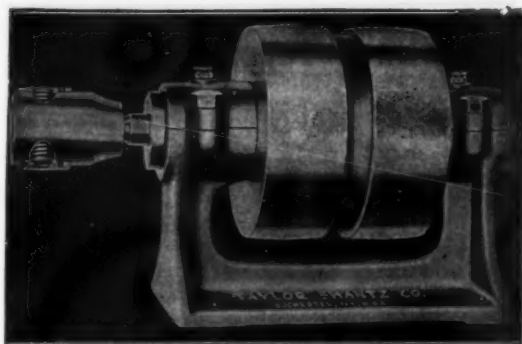
(See Illustration)

The strongest and most durable single caster. Won't crush or break. Swivels on steel machined rollers.

Write for Price List

**THE HAMILTON
CASTER & MFG. CO.
HAMILTON, OHIO**





T-S Bench Tapping Machine

0 to 5-16" Capacity

**Will save you many dollars
with an outlay of only a few**

Price \$25 Complete

F. O. B. Rochester, N. Y.

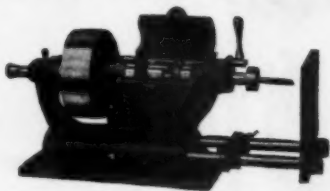
**Fully equipped, including Jacobs Chuck.
No Extras. Rapidly taps all metals of
medium thickness with minimum breakage.**

Taylor-Shantz Company

480 St. Paul Street,

Rochester, N. Y.

Workwell Tapping Machines



And *Workwell Countershafts* are well constructed machines. They cannot be classed with cheaper makes. If production and construction mean anything to you, send for our latest catalog. It will interest you.

Workwell Engineering & Mfg. Co.

Dept. 3. - - 4143-47 W. Kinzie St., Chicago, Ill.



It Is Foolishness To Continue Breaking Taps

The most difficult work—including tapping tough metals, blind tapping, and bottom tapping in shallow holes, where a stop on a machine is useless—can be done in absolute safety to taps and work by using a

Woodstock Improved No-Tap-Breakage Chuck

It automatically releases tap the minute it binds or strikes bottom. Tap breakage is thus positively eliminated, saving material, time and money. Uses standard taps. Made in five sizes.

Glad to send one on trial

Peter Bros. Manufacturing Co.

115 Railroad St., Algonquin, Ill.

Rickert-Shafer Friction Driven Tapping Machines

*Reduce
Costs!*



"R-S" Horizontal Bench Tapping Machines do dependable work up to their capacities in steel. The instantaneous reversing mechanism eliminates all shock to the tools and prevents tap breakage. The friction drive is always under perfect control, and is highly efficient.

The illustration shows our $\frac{5}{8}$ " horizontal bench tapper, which we also make in $\frac{3}{8}$ " and $\frac{1}{2}$ " sizes, bench or floor type. Can be direct connected to motor. Our verticals are made in sizes, $\frac{1}{4}$ " and $\frac{1}{2}$ ". Our radials are made in $\frac{1}{2}$ ", and save handling of auto and machine tool parts, enabling manufacturers to increase their output.

*Be sure to get a copy of our Tapping
Machine Bulletin*

RICKERT-SHAFFER CO., 1110 Cherry Street, **ERIE, PA.**

Your foreman and master mechanic will be interested in
The Broach Well Keyway Set

Used under an arbor press, these tools will cut smooth, accurate keyways, cheaply and quickly.



Patent Pending

An illustrated circular descriptive of the tool and its uses mailed on request.

Velco Manufacturing Company, Inc.
Greenfield, Mass.

Since 1905

This

Keyseater

Has been in daily commercial use. It is worth your time to write for catalog O and get details on this tool for your work.

National Machine Tool Company
2268 Spring Grove Ave., Cincinnati, O.

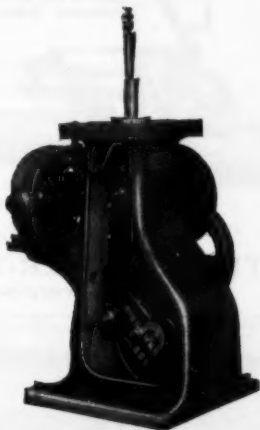


"Catlin" Economy Keyseaters

Rapid — Simple — Accurate

**Catlin No. 8
Cuts
Keyseats,
1-16" to 1½"**

**Stroke
Adjustable
Up to 13"**



A quality keyseating machine of uncommon simplicity. Its range covers the needs of the average machine shop.

It has the crank motion, which enables the cutter to enter cut during the slow part of the stroke—preferable to the usual rack and pinion drive where rate of travel does not vary.

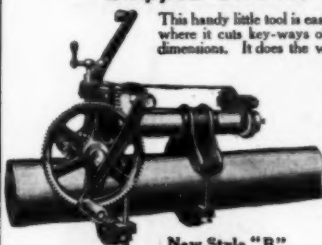
Carries cutter bars from ½" to 1½" diameter, self-contained, and incorporating in them the tool relieving and feeding mechanism. Tools are inserted and removed without special tools.

On some classes of work keyseating operations can be duplicated right along without clamping piece or stopping machine.

For maximum keyseating output at bed-rock cost it can't be beat. Your Address?

**Chattanooga Machinery Company
Chattanooga, Tenn.**

A Strong Portable Key-Way Cutter Shipped On Free Trial



New Style "B"

This handy little tool is easily taken right to the job where it cuts key-ways of just exactly the right dimensions. It does the work quickly, accurately and at minimum cost, saving labor and money. Just clamp the tool to the shaft and turn the crank.

Style "B" has six milling cutters and cuts keyways from $\frac{1}{4}$ " to 2" wide, in shafting 2 in. to 8 in. in diam. and 12 in. long without re-setting.

Send for our 30-day Free Trial offer

THE BUCHER-SMITH CO.
East Liverpool, Ohio



"Wear-Ever" Woodruff Chuck And Keyway Cutter

The "Wear-Ever" Woodruff Keyway Chuck insures a positive drive and true-running cutter. Eliminates making collet chucks. Fits all standard makes of milling machines, and is made in all tapers, such as Brown & Sharpe and Jarno tapers.

Let us supply you with cutters

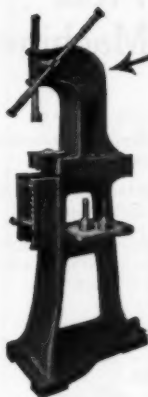
No extra charge for the square



Centers by the shank

Drives by the square

SCULLY-JONES & COMPANY, 555 Railway Exchange Bldg.,
CHICAGO, ILL.



**See that
strengthening
rib!**

Nicholson Arbor Presses are built to endure the hardest sort of machine shop service. Frames of best semi-steel, racks, pinions and levers of heat-treated chrome-nickel steel—sturdy and compact—they last for years. Made in five sizes, and of course they're useful for many other sorts of work besides pressing out arbors.

Nicholson Expanding Mandrels

Just nine of them to a set—and they instantly fit *any* hole, round or square, from $\frac{1}{2}$ " to 7". If you're using solid mandrels now, you can figure for yourself the saving in time, labor, and storage space a set of these would effect in your shop.

*Details and prices of these and other
Nicholson products on request.*

W. H. Nicholson & Co.

117 Oregon St.,

Wilkes-Barre, Pa.

Agencies:

BURTON, GRIFFITH & CO., Ltd.
Ludgate Square, London, E. C.

MONTI & OSCURO
Milano, Italy

BURTON FILS
68 Rue des Maraais,
Paris, France

ANDREWS-GEORGE CO.
16 Takegawa-Cho, Kiobashi-Ku
Tokyo, Japan



Combined Arbor Press And Straightening Machine

It's A
"TOWSLEY"



Capacity, 48" between centers.

Straightens round bars up to 2½" diameter.

Straightens pipe, tubing, crankshafts, etc., up to 8" diameter.

This unique combination of two-machines-in-one permits us to manufacture it of high-grade material, carefully fitted and nicely finished like a machine tool, and still offer it at an attractive price for the many helpful things it will do—and do well.

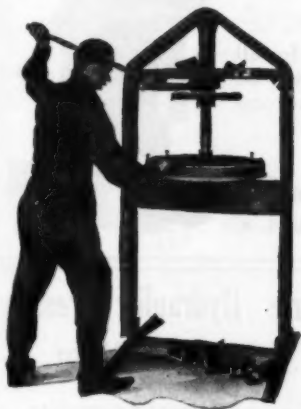
Everyone knows how an Arbor Press saves time and money on innumerable jobs, and the "Towsley" is a good one. It is also exceptional as a Straightening Machine, for taking the bends and short kinks out of short stock before being turned. A Micrometer Indicator Head, mounted on a surface gauge, is furnished for work requiring extra accuracy.

Its many economies will appeal to you. Better have the full description

John T. Towsley Mfg. Co., 1037 Woodrow St.,
Cincinnati, Ohio

WEAVER

Forcing Presses



are saving time
and money and
improving the
quality of work
in thousands of

**Garages
Electric
Shops
Machine
Shops
and
Factories**

because of their wide range of application to both
bulky and small work, due to their

**Great Depth Adjustment
Quick Release Feature
and Enormous Leverage**

enabling the operator to exert a pressure of 28 tons
without assistance. For complete description and
prices, write for catalogue.

WEAVER MFG. CO.

HARVARD PARK,

SPRINGFIELD, ILLINOIS

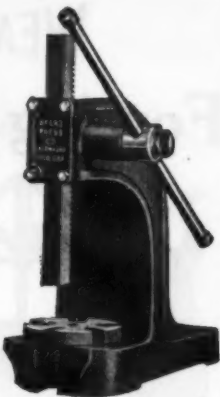
Atlas Presses

pay for themselves
quicker today than
ever before.

Built in all sizes for all
work which can be
practically accom-
plished by hand.

Atlas Press Co.

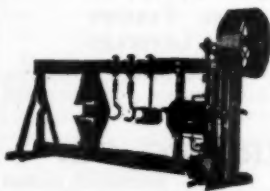
Kalamazoo, Mich., U. S. A.



Lourie Hydraulic Presses

Are Known the World Over

We manufacture a complete
line of standard hydraulic
presses.



We also make
special presses.

Write for catalog

Lourie Mfg. Co.

Springfield, Ill.

Pounding or Pressure!

A Sledge Hammer or a
Greenerd Arbor Press



From
15 Lbs.
to
40 Tons
Pressure

Why use the Sledge when a Greenerd will do the work so much easier, quicker, cheaper and in every way better, besides doing many things which cannot be done with a sledge hammer even in the hands of the most skilful?

In modern shops the sledge is not used for any work that can be accomplished with the steady, powerful pressure of the Greenerd Press. The economy of it is so great, the convenience of it so compelling, that it is universally regarded as indispensable.

If you don't know the Greenerd, get acquainted with it; when you do know it, you'll want one—or more.

EDWIN E. BARTLETT, Nashua, N. H.

The Word
"HARDINGE"

Stamped on Screw Machine collets or
draw-in chucks for tool room lathes

Guarantees Accuracy

Look for the marking

**We can fill your single or quantity orders
in Round, Square or Hexagon.**

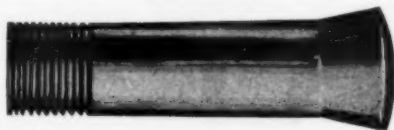
When making inquiries refer to "Chuck Department"

Hardinge Brothers, Inc.

1770 Berteau Ave.

Ravenswood

Chicago, Ill.



COLLETS

for

Lathes and Screw Machines

Any Size

Any Type

Any Quantity

Morrison Machine Products, Inc.

Rochester, "Collet Specialists" New York

Features of Excellence

Keep Shop Costs Down to Bed-Rock



(No. 4 Peerless, Belt Drive. All Gears are Covered.)

THE ECONOMICAL service rendered by B. & K. Pipe Machines is easily understood when you know that—

- ¶ They are equipped with a gear box drive for obtaining the right threading speeds.
- ¶ All uncertainty or guess work in selecting the right speed for threading each size of pipe is positively eliminated.
- ¶ Dies can be changed without removing a screw.
- ¶ Die slot can be cleaned without removing the cover.
- ¶ A rotary oil pump supplies oil to dies and cutting-off tool.
- ¶ Pump is gear driven—no belt to soak up oil.
- ¶ All B. & Ks. have the Peerless adjusting mechanism.
- ¶ The larger machines have two gripping chucks.
- ¶ You have 17 styles and sizes to choose from.

It will pay you to send your inquiry to us now

AT EDWARDSVILLE, ILLINOIS

Bignall & Keeler Machine Works

We are prepared to estimate on
Building Special Machines

from submitted plans and specifications—making special tools.
We have the experience, men
and “know how.”

Let us have your inquiries

A. F. WAY CO., Inc.

P. O. Box 1088,

HARTFORD, CONN.

**Dies, Tools, Jigs, Gauges,
Special Machinery, Ex-
perimental Work and
Manufacturing**

Send us your Specifications

Screw Machine Products

**GEO. H. AINGE TOOL, DIE
AND MACHINE WORKS**

SPRINGFIELD,

OHIO

Our Pipe Benders Meet The Demand



Ever since their invention our hand Pipe Benders have had a steady sale and have given universal satisfaction.

Recently, we have made some improved attachments that permit of a wider range of work and open up a new field in the kind of bending the machine will accomplish.

If you do pipe bending you will find our machine an economical, simple and very efficient appliance in reducing costs and doing better work. For 2" and under.

We have a Bulletin waiting for you. Send for it now.

Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

Manufacturers of Cylinder Boring Bars, Portable Millers, Crank Pin Turning Machines, etc.

Often Cuts Time In Two

Underwood's Portable Miller is Deservedly
Popular in Railway and General Repair Shops

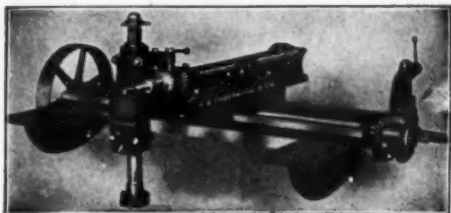


Figure 110

ITS RAPID, accurate, time-saving work satisfies everybody. It enables shops of every size to accomplish a wide range of rush repairs *in place*. The saving is obvious.

Figure 110 has power feed in both directions, and is usable in any position, horizontal, vertical or inclined. It faces a valve seat 22x40x7 in., or does other milling of similar dimensions. Operated by hand, small steam engine, air or electric motor. We can build to suit your special needs. Our line of Portable Tools includes:—

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners and reflex water glass grinders. We build special machines to order.

Write for the Catalog—it pays to have one handy

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue, plus **\$2.50** for name and address. Minimum charge, **\$5.00**. No display permitted in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you seek is not listed, use the blank enclosed to make known your wants to the publisher, who will pass them along to all Machine Tool List advertisers.

FOR SALE BY

J. L. Lucas & Son, Inc., 3 Fox St., Bridgeport, Conn.
METAL BAND SAW.
Napier band saw metal cutting machine.....\$290.

FOR SALE BY

Peninsular Machinery Co., - 429 E. Jefferson Ave., Detroit, Mich.
GAP LATHE.

Gap lathe with sliding bed for garage work. Swings over shear 14"; swings through gap 28". Takes between centers closed 3' 3", and 5' 10" with bed extended. Has double back gear, giving lots of pulling power. Cuts threads 4 to 64. Is complete with compound rest and countershaft.

This is an ideal machine for a garage, as it is a small machine with a large range. It is in fine shape and the price is right. Write for further particulars.

FOR SALE BY

| | |
|---|--|
| Tranter Manufacturing Co., | 105 Water St., Pittsburgh, Pa. |
| Boring mill, No. 2 Cleveland horiz. | Lathe, 16" Cincinnati, with equip. |
| Drill, 20" Barnes, with equipment. | Lathe, 16" Hendey, with equip. |
| Drill, 24" Hamilton, with equip. | Lathe, 18" Bradford, with equip. |
| Drill presses, Avey, (2). | Lathe, engine, 18"x8'. |
| Grinder, No. 3 B. & S. univ., with equipment. | Lathe, speed, Wells, with equip. |
| Grinder, Blount wet emery, & c. s. | Miller, No. 2 B. & S., with equip. |
| Grinder, Hamilton wet tool. | Miller, No. 3 B. & S. pl., with equip. |
| Grinder, New Yankee drill. | Miller, No. 3 B. & S. vertical with equipment. |
| Grinder, cutter, small. | Planer, 3'x8' Gray, with equipment. |
| Hack saw, No. 4 Robertson, with equipment. | Radial drill, 4' Fostick, with equip. |
| | Shaper, 16" Smith & Mills crank. |

FOR SALE BY

Federal Machinery Sales Company,
8 N. Jefferson St., Chicago, Ill. 218 Sycamore St., Milwaukee, Wis.

Used Tools—Great Bargains

Boring mill, No. 3-A Universal horizontal.
Drills, new No. 12 Natco multiple spindle, (2), each with 10 spindles.
Gear generator, 14" Lees Bradner.
Grinder, 6"x32" Norton plain.
Grinder, 12"x24" Modern plain.
Grinder, No. 24 Gardner vertical spindle, horizontal disc.
Miller, No. 14 Rockford plain.
Saw, No. 10 Racine.
Tapper, No. 1 Garvin vertical automatic.
Turret screw machine, No. 1 Southworth.

SECOND-HAND MACHINERY

FOR SALE BY

Walther Machinery Co., 629 Main St., Cincinnati, Ohio

Drill press, D-3 Colburn heavy duty, used.
Drill, 8-spindle multiple, No. 4 Morae, used.
Lathe, 13"x6" Willard d. b. g., s. q. c., c. d., used.
Millers, Whitney hand type, (3); motor driven, d. c., 220 v., (2) used.
Turret machines, Steinle, without side carriage, rebuilt, (9).

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

13"x 5' South Bend, c. r.
14"x 6' Von Wyck, c. r.
16"x 8' Lodge & Shipley, compound rest, patent head.
16"x 6' Hamilton

TURRET LATHES AND SCREW MACHINES.

1" Millholland, plain head.
24"x10" Millholland, g. f. h., p. f.
14" Garvin, g. f. h., p. f.
14" Lodge & Davis, plain head.
24" Davis turret boring and chucking lathe, with forming rest.
22" Lodge & Shipley heavy duty turret boring lathe.
14" Acme screw mche., p. f. to tur., (3).
28" Gisholt heavy duty turret lathe.

DRILLING MACHINES.

No. 1 Burke, bench, (2).
Single spdl, upright sensitive, (2).
24" Baker, hvy. duty, sta. head.

MILLING MACHINES.

Bench miller on column, with c. s.
No. 1 U. S. hand, 3-st. cone., c. s., (3).
No. 15 Garvin plain, b. g.
No. 22 Garvin, vertical spindle.
No. 1 Cincinnati plain.

GRINDERS.

No. 10 Cochrane-Bly auto. bench saw filing machine.
12"x66" No. 4 Landis univ., complete.
No. 1 Brown & Sharpe, univ.
Type "DE" Hisey-Wolf internal.

HAMMERS AND RIVETERS.

No. 3 High speed riveting hammer.
Coffman post pwr. dr. hammer 25 lbs.
Cady belt drop hammer, 100 lbs.

METAL CUTTING TOOLS & SQUARING SHEARS.

Excelsior power hack saw.
12" Burke metal cold saw.
Higley cold saw.

PUNCH PRESSES.

No. 11 Badger, hand.

GEAR CUTTERS.

26" No. 3 Brown & Sharpe auto., (2).
60" Eberhardt, spur.

MISCELLANEOUS.

Boring mche., 23" swing, Star horiz.
Boring mill, 34" Colburn.
Brake, 36" P. S. & W. cornice brake, 20 gauge capacity.
Broaching mche., No. 2 Lapointe.
Crane and hoist, Canton No. 3.
Planers, 22"x22"x5' Putnam, 1 hd., (3).

Polishing lathes, City Machine Co. Press, No. 65-A Consol., s. s., grd. Press, D-301 Ferracute redrawing and trimming.
Radial drill, 3" Gang, speed box.
Tapper, 1" Burke, bench.
Tappers, 1" Rickert-S. horiz., (2).

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co.,

1603 St. Clair Ave., N. E., Cleveland, O.

Good Tools—Low Prices

BAR STOCK MACHINES AND TURRET LATHES.

- | | |
|--|---------------------------------------|
| 2" & 3" P. & W. turret lathes, power cross and long. feed. | No. 1 Warner & Swasey screw mche. |
| 14" Warner & Swasey turret lathe. | 21" & 24" Gisholts, taper attachment. |

BOLT AND NUT MACHINERY.

- | | |
|------------------------------------|--|
| 3" Landis bolt cutter, late model. | 4" Landis extra long bed, motor drive. |
| 1" Acme, style B. | |

BORING MILLS.

- No. 32 Giddings & Lewis horizontal.
 48" Gisholt double swivel head, single pulley.
 51" Niles, swivel and turret heads, gear drive.
 72" Sellers, 2 swivel heads.

DRILLING MACHINES.

- | | |
|---------------------------------|---------------------------------|
| 2" American radial, plain. | 4" Morris plain, single pulley. |
| 5" Fodick radial, plain. | 9" Cleveland wall radial. |
| 6" Dreses, full universal. | 28" Sibley, sliding head. |
| 4" American, cone drive. | 26" Barnes, tapping attachment. |
| 4" Western, plain, motor drive. | |

GRINDERS.

- | | |
|-----------------------------------|-------------------------------------|
| No. 3 Cincinnati 12x48 universal. | 12" Bridgeport, a. c., motor drive. |
| 14x50 Norton plain. | New Yankee drill, motor drive. |
| 18" Bryant internal. | |

LATHES.

- | | |
|---|--|
| 24"x14' Boye & E., cone dr., d. b. g. | 34"x18' Putnam, cone dr., solid spdl. |
| 14' x 8' Champion, taper attachment, q. c. g., d. b. g. | 42"x28' Pittsburgh heavy duty, triple geared, motor drive. |
| 16' x 8' Bradford, q. c. g. | 42"x20' Schumacher & Boye, q. c. g. |
| 32"x20' New Haven, b. g., cone drive, solid spindle. | 42"x32' New Haven, d. c. motor dr. |
| | LeBlond universal crankshaft lathe. |

MILLING MACHINES

- | | |
|---|--------------------------------|
| No. 3 LeBlond heavy duty universal. | No. 2 Brown & Sharpe vertical. |
| No. 3 Brown & Sharpe plain. | No. 12 Brown & Sharpe plain. |
| No. 3-B heavy Brown & S. plain. | Type A Briggs, Lincoln. |
| No. 2 Cincinnati pl., cone dr., gr. fd. | No. 7-H Becker, Lincoln type. |

PLANERS AND SHAPERS.

- | | |
|-------------------------------------|--|
| 24"x24"x 6' Liberty. | 48"x48"x20' Patch, 4 heads, reversing motor drive. |
| 30"x30"x 8' Niles-B.-P., box table. | 60"x60"x20' Sellers, spiral dr., 4 hds. |
| 24"x24"x 6' Gray. | 24" Gould & Eberhardt shaper. |
| 24"x24"x 6' Pease. | |

PRESSES.

- D-301 Ferracute, 4" stroke, 32" between housings.
 200-ton Southwark hydraulic flanging press, 5' gap, accumulator, Worthington vert. triplex pump. 24 h. p. Westinghouse motor, for flanging boiler hds.

PUNCHES AND PLATE WORKING TOOLS.

- 16' Hilles & Jones $\frac{1}{2}$ " plate bending rolls.
 Henry Pels armor plate beam and angle shears.
 12" Southwark horizontal punch, $\frac{1}{2}$ " thru $\frac{1}{4}$ ".
 64" No. 2 Long & Allstatter single end shear, $\frac{1}{2}$ " plate.
 64" No. A Long & Allstatter single end punch, $\frac{1}{2}$ " thru $\frac{1}{4}$ ".
 No. 4-B Quickwork rotary shear, 60" throat, $\frac{1}{2}$ " plate.
 Globe double end punch and shear, 30" gap, 1" thru 1".
 42" throat single end plate shear.
 American Ship single end punch and shear, 38" throat, $\frac{1}{2}$ " thru 1".

RIVETING MACHINES.

- 10' Morgan horiz. bull riveter, 14" plunger, 30-ton hyd. crane, Dean trip. pump.

RIVET MAKING MACHINE.

- Acme size "A" rivet and track bolt machine, large equipment.

SLOTTERS.

- | | |
|------------------------|-------------------------|
| 16" Betts, cone drive. | 18" Newton, cone drive. |
|------------------------|-------------------------|

MISCELLANEOUS.

- | | |
|--|---------------------------------|
| Cold saw, No. 11 $\frac{1}{2}$ Higley. | Motor, 10 h. p. Card, d. c. |
| Crankshaft, 18", for 77 $\frac{1}{2}$ Bliss press. | Motor, 3 h. p. Cleveland, a. c. |
| Keyseater, No. 4 Baker Bros. | Thread roller, No. 4 Manville. |

SECOND-HAND MACHINERY

FOR SALE BY

Sebastian Lathe Company,

Cincinnati, Ohio

LATHES.

All cone head. Used in our own shop. Priced low to move quickly. Cash required with order.

| | | | |
|-----------------------|---------|---------------------|---------|
| 15"x8' Sebastian..... | \$ 325. | 14"x8' Reed..... | \$ 150. |
| 15"x6' Sebastian..... | 325. | 14"x6' LeBlond..... | 175. |
| 15"x8' Sebastian..... | 300. | | |

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

| | |
|---|---|
| 43"x17'4" Bement-Miles. | 24"x14' Porter. |
| 42"x25' 6" Putnam. | 21"x8' LeBlond. |
| 42"x26' Johnson d. b. g., t. a. | 20"x8' 6" Walcott, d. b. g., q. c. g., (2). |
| 42"x16' Niles. | 20"x 8' Whitcomb Blaisdell, q. c. g. |
| 37"x14' Johnson d. b. g., q. c. f., t. a. | 19"x12' Flather. |
| 32"x12' Pittsburgh, heavy duty, q. c. g. | 19"x10' Draper, patent head. |
| 26"x16' 6" American, q. c. g. | 18"x 7' Chard, d. b. g., semi q. c. g. |
| 27"x12' Bullard. | 18"x6' to 8' lathes, (6). |
| 26"x11' Wickes, q. c. g. | 17"x 6' Lodge & Shipley, q. c. g. |
| 28"x10' Niles, q. c. g. | 16" Lathes, (10). |
| 23"x14' Hendey, q. c. g., taper attachment, oil pan, (2). | 14" Lathes, (19). |
| | And many others. |

TURRET LATHES.

| | |
|-----------------------------------|-----------------------------------|
| 43"x 6' Lodge & Shipley chucking. | No. 22 Garvin Monitor. |
| 28" Pond, triangle. | No. 3 Bardons & Oliver, back grd. |
| 3x36" Pratt & Whitney hollow hex. | 14"x4' Warner & Swasey. |
| 19"x7' Fay & Scott. | |

DRILL PRESSES.

| | |
|---|---------------------------------------|
| 5' Bickford radial. | 14" 4-spindle Allen sensitive. |
| 5' Prentice radial. | 40" Lodge & Davis, b. g., sliding hd. |
| 42" Economy radial. | 20" Barnes, geared head. |
| 40" Barnes horizontal radials, (2). | 20" Hoosier, new, (3). |
| 36" Bickford radial, circular base, motor driven. | 20" Champion, new, (6). |
| 18" 4-spindle 2-housing, Foote-Burt. | 12" Allen, bench. |
| 14" 6-spindle Allen sensitive. | Plain drills, all sizes. |
| | Drill presses, assorted sizes. |

MILLING MACHINES.

| | |
|--------------------------------------|--|
| 38"x6' Ingersoll horizontal slab. | Whitney hand miller. |
| No. 5 Cincinnati, table 9'x50'. | No. 27 Industrial Works, Lincoln type, table, 7x27". |
| No. 15 Garvin, table 12x42". | Gooley & Edlund, 7'x46" table. |
| No. 3 Becker Brainard, table 12x40". | |
| No. 3 Cincinnati, table 12'x47". | |

PLANERS AND SHAPERS.

| | |
|-----------------------------------|-------------------------------|
| 48"x48"x16' Pond planer, 3 heads. | 30" Cincinnati. |
| 26"x28"x 6' Hendey planer. | 16" Gould & Eberhardt shaper. |
| 48" Morton draw-cut shaper. | 14" Warren shaper. |
| 39" Pedrick & Ayer, open side. | |

MISCELLANEOUS.

| | |
|--|--|
| Bolt machine, 1" National. | Keyseater, Mitts & Merrill No. 5. |
| Boring mill, 100" Sellers, vert., dbl. hd. | Keyseater, Mitts & Merrill No. 2. |
| Boring mill, car wheel, 60" Newton. | Punch presses, all sizes, (105). |
| Boring, drilling and milling machine, 17' Bement Niles horizontal. | Punch & shear, Industrial Wks. d. e., capacity 1" in 1", squaring 1"x6". |
| Grinder, 13'x5' Landis universal. | Slotter, 30" Niles. |
| Grinder, disc, No. 17 Besly. | Slotter, Newton, 20"; cir. table. |
| Grinder, disc, No. 1 Besly. | Slotter, Newton, 18"; cir. table. |
| Hammers, 60 lb. Bellefonte upright, (2). | Slotter, Bement 10"; cir. table. |
| Keyseaters, 18" stroke Morton, (2). | Tooth rounding machine, Schuchardt & Schutte. |

Large assortment of General Machinery. Send for Complete List.

SECOND-HAND MACHINERY

FOR SALE BY

Brown Machinery Co.,

2323 N. 9th St.,

St. Louis, Mo.

LATHES.

12"x 6' Lancaster, c. r., h. s., new.
14"x 6' Walcott, q. c. g., d. b. g.; new.
16"x 6' Reed-Prentice.
16"x 8' Walcott, q. c. g., d. b. g., new.
16"x 8' Monarch, d. b. g., q. c. g.
18"x 8' Monarch, d. b. g., q. c. g.
20"x 8' Lodge & Shipley; used.
20"x 9' Williams turning lathes.
20"x 10' Walcott, q. c. g; d. b. g.; new.

20"x 12' LeBlond; used.
24"x 10' Fay & Scott, h. s., used.
24"x 12' Putnam.
26"x 8' Walcott plain turning.
26"x 12' Walcott, q. c. g., d. b. g., new.
26"x 12' Wickes, heavy duty, quick change gear, double bk. gear, with taper attachment, new.
26"x 12' Draper, triple geared.

TURRET LATHES.

Foster No. 3, plain head, (7).
Wood Tilted Turret, 14" cap., (2).
Omar, 16x6, b. g. p. f. with equip.
Gisholt, 16" Type A., b. g., (2).

Wysong & Miles, 24" b. g., p. f., air chuck, (2).
16"x 7' Fulton, b. g., p. f., (4).
14"x 4' 6" S. & K. plain head.

DRILLING MACHINES.

No. 1 Burke, bench, chucks, new.
Henry & Wright single spindle, h. s., 4" cap.
J. Leland Gifford, high speed.
4 spindle Garvin; used.
4 spindle Allen, high speed cap. 29/32.
4 spindle Avey, high spd.; used.
5 spindle Allen, high speed cap. 29/32.

6 spindle Allen, high speed cap. 29/32.
13" Prentice, p. f., stat. table, used.
24" Milwaukee, sliding head, back gear, power feed.
20" Champion, s. b., b. g. & p. f., new.
20" Champion, s. b., w. & l., new.
26" Barnes, sl. hd., b. g., p. f.; used.
30" Gould & E., sl. hd., b. g., p. f.

MILLING MACHINES.

No. 2 American Lincoln, b. g., new.
No. 1 U. S. hand, vise and arbor.
No. 2 P. & W., Lincoln type, used.
No. 1 B Fox hor., h. & p. f., new.
24" Osterlein, universal.
Becker No. 7H Lincoln; used.
Hendey No. 4 Lincoln type, q. c. g.
Foster thread miller.

No. 3 Garvin, hand, used.
No. 3 B Owen pl. hor., with vertical attachment & dividing head, used.
Hendey, Lincoln type, b. g. with q. c. g. to feed, tables 11x30, (6).
No. 6 Whitney, hand; used.
No. 3 Fox, hand & power fd., used.
No. 4 Becker-Brainard, pl., pr. fd.

PRESSES.

Nos. 1, 2, 3, 4 Loshbough-Jordan, o. b. l., new.
No. 1 Greenerd, arbor, used, (9).

No. 2 Greenerd, arbor, used, (6).
Nos. 2 & 3 Geier, arbor; new.
Perfection, 30 ton, arbor; new.

SAWS.

Nos. 1 & 2 Marvel, draw cut, new.
No. 1 Racine, 6x6 high speed, new.

Racine hi-speed, 3 sp., 8x8" used.
Williamson, metal, used.

GRINDERS.

Nos. 1, 2 & 3 Western, d. e., new.
Nos. 1, 2 & 3 St. Louis, d. e., new.
No. 20 Safety E. W. Co., elec. (4).
No. 1 Grand Rapids universal cutter and tool; new.
Wood No. 2 Univ. cutter & tool; used.
Oesterlein No. 2, cutter & tool.

G. R. B-2-T drill grinder.
U. S., electric, 110 v., d. c., bench.
Essley, cylindrical.
No. 1 American, surface; new.
No. 2 American, surface, new.
14" Besly wet ring grinder.

HAMMERS.

25 lb. Rochester helve, used.
Foot hammer, Standish.
600 lb. Lane, dbl. fr., st. forging, used.

No. 50 Star trip hammer, new.
1200 lb. Chambersburg double frame, steam forging, used.

MISCELLANEOUS.

Accumulator, Metalwood, with wts.
Blower, No. 5 American.
Bolt threader, Greenfield 1/2" to 2".
Brake, 8" Chicago, steel; new.
Cut-off machines, Modern.
Dicing-out machine, 9' Hawkins.
Furnace, melting, Steele-Harvey.
Hoists, air, 4x45" Northern.
Lathe chucks, all sizes to 16" diam.
Motors, 5 and 10 h. p. G. E., 220 v., 3 ph., 60 cy.

Pipe cutter, B. & K., 4" cap.
Pipe mch., No. 76 Forbes, 3", used.
Pipe machine, 3" Borden, hand.
Profilers, No. 12 P. & W., 2 spd.
Riveters, Grant and Shuster; used.
Riveter, air, P. & A. swinging.
Shaper, 16" Whipp, sgl. gr.; new.
Shaper, 16" Gould & Eberhardt; used.
Stake punch & riveter, No. 3 Hilles & Jones, 5' thr., wt. 16000 lbs., used.

SECOND-HAND MACHINERY

FOR SALE BY

J. L. Lucas & Son, Inc.,

3 Fox St., Bridgeport, Conn.

PRESSURE BLOWER.

Root pressure blower, 1½" outlet, suitable for small furnace; 27 cu. ft. per minute; nice condition; C.O.D. \$20.

FOR SALE BY

Atlantic Manufacturing Co.,

Wilmington, Del.

Belting: Large quantity used leather belting which has been made over; A-1 condition; all the principal sizes.

Belting, surplus stock of new leather, rubber and canvas.

Pulleys, steel and wood.

Special prices. Send us your inquiries.

FOR SALE BY

A. D. White Machinery Co.,

108-114 N. Jefferson St., Chicago

ENGINE LATHES.

14"x 6' Smurr & Kamen.

18"x 7' Chard, d. b. g., p. c.

18"x 8' Bell, d. b. g., p. c.

20"x 8' Hamilton, d. b. g., s. q. c.

20"x 8' Lodge & Shipley, grd. hd.

20"x 8' Reed, s. b. g., p. c.

20"x 8' Reed, motor driven.

22"x 10' Davis, d. b. g., q. c.

32"x 10' Pond, s. b. g., p. c.

34"x 10' Putnam, s. p. g., p. c.

38"x 14' Fifield, s. b. g., p. c.

MILLING MACHINES.

No. 0 Rockford, plain.

No. 25 Becker, horizontal.

No. 1 Newton slab.

Model AB Becker, vert., motor dr.

Type "A" Briggs (2).

DRILL PRESSES.

20" Mechanics, friction.

20" Barnes, sliding head.

20" Barnes, sliding head.

36" Aurora, sliding head.

2 spindle Guarantee, h. s., b. b.

4 spindle Reed sensitive, ½" cap.

24" No. 24 Foote-Burt heavy duty.

2 spindle 24" Barnes, all grd. gang.

PUNCH PRESSES.

No. 1 Consolidated, grd., (2).

No. 0 American Can.

No. 8 & No. 11 Bliss auto. button

presses.

19" throat geared punch.

New Swaine o. b. i. presses Nos. 27,

29, 31, 33, 35 and 37.

TURRET LATHES AND SCREW MACHINES.

No. 3 Foster, plain head.

20"x 5' Bridgeport, (2).

20"x 8' Fay & Scott universal.

22"x 5' Reed.

21" and 24" Gisholts.

3x36" Jones & Lamson.

14"x 10" Milholland.

11" Biggs (2).

No. 1 Garvin, hand, (4).

No. 1 B. & S. auto. ½" (2).

BOLT CUTTERS AND PIPE MACHINES.

14" Acme, double head.

3½" Acme single head, (2).

4" Acme single head.

4" Saunders (2).

8" Eaton, Cole & Burnham.

MISCELLANEOUS.

Blower, No. 7 Sturtevant, high press.

Boring mch., 2½" bar, Binsse horiz.

Gang splitter, takes 21" sheets.

Gang splitter, takes 29½" sheet.

Gas engine, 35 h. p. Columbus.

Gas engine, 55 h. p. Bruce-McBeth.

Grinders, No. 2 Woods tool & cutter

Grinder, No. 2 Oesterlein tool & cut.

Grinder, 10x30 Landis plain.

Grinder, Springfield, 2-wheel wet.

Grinder, Leland & F., wet.

Planer, 30"x30"x10' Pond, 1 head.

Profiler, 2 spindle Putnam.

Riveter, ½" Shuster.

Saw, No. 5½ Nutter-Barnes.

Screw slotter, Garvin hor 2/16 to ½".

Tapper, No. 2 Garvin, auto.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Co., - 28th St. & A. V. R. R., Pittsburg, Pa.

LATHES.

48"x32" N. B. P., triple geared.
 48"x28" Niles, c. r.
 48"x26" Pond, triple geared.
 36"x18"8" Niles, c. r.
 28"x12" Boye & Emmes, q. c. g., d. b. g.
 28"x12" Pittsburg, dbl. b. g.
 26"x20"6" Putnam, b. g., c. r.
 26"x10"6" Walcott, q. c. g.
 24"x16"6" Johnson lathe.
 24"x12" Ames, b. g., c. r.
 18"x8" Mueller, q. c. g., new.
 19"x10" LeBlond, motor drive.
 18"x8" Sidney, q. c. g., d. b. g.
 18"x8" Rahn-Mayer-Carpenter.
 16"x6" Columbus, q. c. g., new.
 15"x8" Schellenbach, d. b. g., h. s.
 14"x6" Hendey, q. c. g.
 10"x56" Star, foot power.
 24"x6" Gisholt turret, 64" h. s.
 24"x6" Gisholt tur., 64" h. s., m. d.
 15"x5" American brass finishers'.
 14"x5" American speed lathe.
 13"x5" Blount speed lathe.
 18"x7 1/2" Wood lathe.

PLANERS AND SHAPERS.

20"x20"x81" planer, 1 hd.
 24"x24"x8 Chandler planer, 1 head.
 48"x48"x22 1/2" Pond planer, 4 heads.
 72"x56"x12 1/2" Betts planer, 2 heads.
 16" American shaper, b. g., m. d.
 16" Gould & Eberhardt, b. g.
 24" Cincinnati b. g. shaper, m. d.
 24" Walcott geared shaper.

DRILLS AND BORING MILLS.

20" Champion, new, pl. w. & l.
 20" Silver, new, plain w. & l.
 24" Aurora upright, b. g.
 36" Snyder b. g. drill.
 40" New Haven, b. g. drill.
 3', 4' & 6' Prentice radial drills.
 No. 3 Phoenix air drill.
 No. 1 Myers 10" sensitive drills.
 10" Dwight-Slate sensitive, floor.
 14" U. S. sensitive drill.
 30" Warner-Swasey boring mill.
 36" Bridgeport boring mill.
 42" Bullard boring mill, 2 heads.
 50" Bullard boring mill, 2 heads.
 60" Niles boring mill, 2 heads.
 90" Niles boring mill, 2 heads.

PUNCHES, SHEARS, PRESSES AND ROLLS.

50" throat Reade sgl. end punch and shear; massive construction.
 No. 45 Buffalo punch, 3"x3".
 No. 4 Doelger & Kirsten alligator shear, cap. 4 1/2" round soft steel.
 Garrison m. d. alligator shear, 15" knife, cap. 3" square, 36000 lbs.
 Lewis m. d. alligator shear, 24" knife, cap. 3 1/2" square, weight 50000 lbs.
 Morgan plate shear, 96"x1" thick.
 Garrison plate shear, cap. 3"x81" m. d.
 Mesta plate shear, cap. 3"x156".
 Knight s. e. punch, 8" thr., 3"x3".
 No. 56 dbl. housing knuckle press.
 Stiles Nos. 3 & 23 inc. presses.
 Bias No. 18 o. b. i. power press.
 Straight-side trimming press, 6" str.
 Straight-side punch press, 4" str.
 Bias No. 76 1/2 s. s., d. g. press, 11" str.
 Corry Mch. Co. press, 12" stroke.
 No. 116-A Niagara press, m. d.

MILLING MACHINES.

No. 3 LeBlond plain. No. 12 Garvin plain, 18"x6"x15".

MISCELLANEOUS.

Air compressor, No. 0 Au-To 3"x4".
 Air compressor, 8"x8" hor. b. d.
 Band saw, Greaves-Klusman 36".
 Band saw, Kane-Roach 32".
 Bender, Wallace No. 11 angle, hd. pr.
 Blower, Root No. 3 Acme, hand.
 Blower, Sturtevant, No. 4, volume.
 Blowers, Buffalo Nos. 5 and 8.
 Boiler, 24"x5" vertical.
 Bolt cutter, Landis 1 1/2".
 Brazing table, all iron, 17"x29 1/2"x31".
 Bulldozer, No. 2 Williams-White.
 Chain belt, 16"x3"x1 1/4" p. and gear.
 Cold saw, No. 17 Higley, 20" saw.
 Cold saw, Wagner, size 18 type 3.
 Cold saw, Gliem, 22" diam. 6" cap.
 Crane, 10" I-beam, 12'3" span.
 Crimping machine for short work.
 Fan, 48" ventilating.
 Forges, Nos. 41-43 Champion new.
 Grinder, Greenfield cutter & tool.
 Grinder, Diamond No. 3 wet tool.
 Grinders, Plymouth Nos. 13, 14, 17.
 Grinder, Barnes 20" wet tool.
 Hammers, 100 & 200 lb. belt power.
 Hammers, 2500 lb. Chambersburg, double leg steam forging.
 Heading, upsetting and forging machine, 3" National.
 Hoist, contractor's steam, with 8 h. p. boiler & 5 h. p. engine.
 Index centers, 12" B. & S. univ.
 Metal lockers, 10 sections.
 Polishing stand, Diamond No. 2.
 Polishing stand, d. end, 42"x3 1/2" arbor.
 Polishing stand, Cuyahoga dbl. end.
 Ripsaw, table, 49"x30".
 Saw, North Wales, hack, 5"x5".
 Slotter, Niles 15".
 Straightening rolls, 84x10 Cleveland.
 Trimmer, American No. 2, univ. wood.
 Wiring machines, Pexto, bench.

SECOND-HAND MACHINERY.

FOR SALE BY

**Reliance Machinery Sales Co.,
Brighton Road At Pennsylvania Ave., Pittsburgh, Pa.**

Bolt cutter, Reliance, 14".
Boring mill, 24" Bullard Rapid Production.
Boring mill, 30" Colburn, turret hd.
Boring mill, 90" Niles, 2 swivel hds.
Drill, 3 1/2" Prentice radial, t. a.
Gear cutter, 15" G. & E. comb.
Lathe, 14"x6" Sidney, quick change.
Lathe, 18"x8" Lodge & Shipley, q. c. g.

Lathe, 26"x10"x6" Walcott, q. c. g.
Lathes, 24"x26" Greenlee, cross feed.
Miller, 30"x30"x9" Ingersoll, 2 hds.
Pipe machine, Jarecki, 1" to 4".
Pipe machine, Cox, 2" to 6".
Pipe machine, Merrill, 3 1/2" to 12".
Press, No. 86 Niagara cam drawing.
Riveter, 1/2" Shuster.
Shaper, 24" Stockbridge, p. d. f.

FOR SALE BY

The Enterprise Machinery Co.,

28 S. Clinton St., Chicago

Air hoist, Ing.-Rand 5-ton (new \$525) \$ 195.
Boring mill, 48" vert., 10000 lb. 700.
Boring mill, hor., 3" bar, 95% 1650.
Boring mill, 36" Niles, 2 hds. 1750.
Drill, heavy, Baker 375.
Drill, 24" Barnes, b. g., p. f., hvy. 150.
Grinder, Landis No. 1 550.
Grinder, Bath No. 2 cylindrical 700.
Grinder, Landis, 14x32 univ. 1200.
Keyseater, Baker No. 00 150.
Lathe, LeBlond 19x6 q. c., d. b. g. 375.
Lathe, 26x14 Walcott, q. c., d. b. g., crank 1300.
Lathe, 28x14 Rahn Carpenter heavy duty, fine condition 1100.

Lathe, 49x18 McFarland, b. g. \$1100.
Miller, No. 4 B. & S., q. c., pl. 1500.
Miller, No. 1 Kempsmith, q. c. pl. 475.
Punch press, No. 3 Walsh 315.
Punch press, Bliss No. 734, b. g., 2200.
Punch pr., Consol. No. 33 arch. 650.
Punch press, bench, auto. roller fd., our ad elsewhere this issue 160.
Punch, sh. & rod c. 1"x3/4" \$250-350.
Radial, 42", Prentiss, agl. pul. 90% 800.
Radial, Am. 4' high sp., 90% 550.
Roll, 20" Wickes, 11/16 drop end 4200.
Screw mche., Gridley 1 3/4, (5) 2500.
Shear, Lenox 1/2", 90% new 375.
Turret lathe, Gisholt 2 1/2", 90% 600.
500 other tools. Write us.

FOR SALE BY

W. P. Little Co.,

1616 Columbus Road, Cleveland, Ohio

LATHES.

13"x 6' Prentiss, c. r., t. a.
14"x 6' Blaisdell, e. r.
14"x 6' LeBlond, c. r.
14"x 6' plain rest.
16"x 6' LeBlond gap, c. r.

20"x10' Rahn & Meyer, c. r.
20"x10' Lodge & Davis, p. r.
24"x15' New Haven, c. r. & t. a.
26"x 9' Bridgeford, q. c. g., (3).
30"x10' Plain turning.

DRILL PRESSES.

20" Silver, a. b., w. & l., (2).
20" Hofer, b. g., p. f.,
20" Prentice, w. & l.

24" Aurora, b. g., p. f., a. h.
28" Aurora, b. g., p. f., a. h.
24" Heavy duty.

MILLING MACHINES.

U. S. hand millers, (4).
No. 1 Brown & Sharpe universal.

No. 4 Hendey Lincoln.
Reed, Lincoln pattern, (2).

GRINDERS.

6"x32" Norton plain.
Washburn drill grinder.

No. 23 B. & S. cylinder grinder.
No. 3 B. & S. cutter & reamer.

PUNCH PRESSES.

No. 4 Toledo, o. b. l.
No. 1 Toledo, o. b. l.

18" throat Excelsior, 1/2" cap.
No. 19 Bliss horizontal dial.

MISCELLANEOUS.

Band saw, 36".
Broach, No. 3-A LaPointe.
Furnace, No. 3 Frankfort.
Riveter, 1/2" Shuster.
Screw machine No. 1 Garvin, hand.

Screw machine No. 4 B. & O., hand.
Slotter, 6".
Spline miller, 4" P. & W.
Thread miller, 6"x48" P. & W.
Turret, 18" W. & S.

We buy Used Machinery! What have you to sell?

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company, 111 Broadway, New York
Located at our various factories and stores.

LATHES.

| | |
|---|---|
| 22"x 8' Niles, c. r. | 36"x20' Pond, 230 v., d. c. motor dr. |
| 24"x10' Whitcomb, q. c. | 42"x20' Niles, c. r. |
| 26"x10' Pond, q. c., 220 v., d. c. motor. | 48"x30' Niles, c. r. |
| 26"x26' & 28"x18' Niles, c. r. | 50"x17' F. B. Miles. |
| 28"x12' & 32"x12' Pond, c. r. | 54"x28' American, t.g., 220 v., d.c. mtr. |

TURRET LATHES.

| | |
|--|--|
| No. 6A P. & J. auto., 220 v., mtr. d. c. | 28" size J. Gisholt, 31" spindle. |
| 1"x10" P. & W., turret lathe. | 24" size I Gisholt, 220 v., mo. dr., d. c. |
| 2"x24" Jones & Lamson, cone head. | 32" Conradson turret. |
| 2"x26" Pratt & Whitney turret lathe. | 34" size K Gisholt. |
| 2"x26" Pratt & Whitney, turn table. | |

PLANERS.

| | |
|--|--|
| 30"x30"x 6' Pond, 2 heads. | 36"x36"x25' Bement, 4 heads. |
| 30"x30"x12' Pond, 2 heads, 220 v., d. c., reversing motor drive. | 42"x42"x14' Pond, 3 heads. |
| 30"x30"x10' Pond, 2 heads. | 48"x48"x20' Bement, 4 heads. |
| 36"x36"x12' Gray, 2 heads. | 60"x60"x14' Niles, 4 heads. |
| 38"x38"x10' Niles, 2 heads. | 60"x60"x20' Niles, 3 heads. |
| 38"x38"x12' Niles, 4 heads. | 60"x60"x24' Niles, 4 heads. |
| 36"x36"x16' Pond heavy, 2 heads, 220 v., d. c., reversing motor drive. | 72"x72"x12' Bement, 4 heads. |
| 38"x38"x16' Niles, 3 heads. | 72"x72"x30' Ridgway, 4 heads, 220 v., reversing, motor d. c. |

MILLERS AND GEAR CUTTERS.

| | |
|------------------------------------|------------------------------------|
| No. 5 B. & S. plain cone type. | No. 6 60"x12" B. & S. gear cutter. |
| No. 5 B. & S. vertical, cone type. | 15" Gleason bevel gear generator. |
| No. 3 36"x8" B. & S. gear cutter. | 6"x45" P. & W. thread miller o. s. |
| No. 4 36"x9" B. & S. gear cutter. | 6"x60" P. & W. thread miller o. s. |

DRILLING MACHINES.

| | |
|--|---|
| 40" Aurora, tap. attach. | 5' Ridgway, 220 v., d. c. motor. |
| 3' Grant radial drill and boring mch. | 6' Niles full univ., 220 v., d. c., m. d. |
| 3' Drees plain radial. | 6' Niles semi-universal, old style. |
| 4' Bickford plain radial. | 6' Pond radial, 220 v., d. c. motor. |
| 4' Niles full univ., old style, motor. | No. 13 P. & W. multiple 12 spindles. |

GRINDERS.

| | |
|--------------------------------|--------------------------|
| 12"x36" Cincinnati, universal. | 8"x30" Fraser universal. |
| No. 8 Higley saw grinder. | 10"x72" Norton plain. |

BORING MACHINES.

| | |
|---|--|
| No. 1 Bement horiz., 24" spdl., 5' tbl. | 60" Bement bor. & t. mill. |
| No. 2 Bement horiz., 36" spdl., 6' tbl. | 10' Niles b. & t. mill, 220 v., d. c. mtr. |
| No. 24 Niles horiz., 4" spdl., 6' tbl. | 44" spindle Niles floor borer. |
| No. 3 Bement horiz., 4" spdl., 9' tbl. | 5" spindle Niles floor borer. |
| No. 3 Bement horiz., 4 1/2" spdl., 9' tbl. | 6" spdl. Bement floor boring & drill. |
| No. 4 Bement horiz., 4 1/2" spdl., 10' tbl. | 6 1/2" spindle Niles floor borer. |
| 42" Niles b. & t. mill. | |

MISCELLANEOUS.

| | |
|---|---|
| Air compressor, type 10, Ingersoll-Rand, steam driven, capacity 535'. | Engine, gen. set, d. c., 220 v., 100 k.w. |
| Air compressor, Ingersoll-R. duplex, mtr. dr. 33 h. p. d. c. mtr., cap. 215'. | Graduating machine, LeBlond. |
| Air compressor, Gardner class D, duplex, steam, capacity 837'. | Hammer, 750 lbs., sgl. frame, Sellers. |
| Blower, No. 10 Sturtevant. | Hot blast apparatus, Sturtevant, 120" housed steam fan engine dr., 10 section corrugated base heater 8' 6"x5' 6"x6" high, 440' per section. |
| Blower, No. 70 Buffalo. | Motor, 40 h. p. G. E., type R. C., 1200 r. p. m., 220 v., d. c. |
| Crane, 3 ton, Niles, 14' 2" span. | Pump, 500 gal. Gordon duplex, steam. |
| Crane, 20 ton, 45' span Sellers, 220 volt, motor direct current. | Saw, 8" rounds, Higley. |
| Engine, 125 h. p., Phila. cross comp. Corliss air compressor. | Screw shaver, No. 2 P. & W. |
| Engine, 150 h. p. Phila. Corliss. | Separator, American No. 1, oil. |
| Engine, 200 h. p. Corliss, twin. | Slotter, 6" Bement. |

SECOND-HAND MACHINERY

FOR SALE BY

The Canton Machine Shop Company,

Canton, Ohio

Lathe, 13"x 8' Pratt & Whitney, t. a.
 Lathe, 14"x10' Bradford.
 Lathe, 16"x 8' South Bend.
 Lathe, 14"x 8' Carroll-Jamieson, t. a.
 Lathe, 24"x10' New Haven.
 Lathe, 12"x 8' speed lathe, collets
 and compound rest.
 Metal shingle edging machines, (3).
 Miller, No. 2 LeBlond universal.
 Miller, Brainerd.
 Motor, electric, 5 h. p., d. c.

Paper cutting knife, 5"x36".
 Planer, 26"x26"x6".
 Planer, 48"x48x10' Niles-B.-P., 2 hds.
 Planer, 32"x32"x10' New Haven, 2 hds.
 Punch press, Bliss.
 Punch presses, No. 46 Bliss, weight
 25,000 lbs., (6).
 Radial drill, 3" Fosdick.
 Shaper, 16".
 Wire straightener.
 25 Small grinder heads.

FOR SALE BY

A. M. Stoehr Machinery Co., 844-846 North Wells St., Chicago, Ill.

Only Used Machinery of the Better Class.

Arbor press, No. 3 Atlas compound.
 Bending rolls, 32", b. g., slip end.
 Butt welders, No. 6, No. 9, No. 10A6
 and No. 10A7 Thompson.
 Compressor, steam & belt drive.
 Drill presses, 4, 5 and 6-spdl. Allen.
 Drill press, 20" Champion, b. g., p. f.
 Drill press, 20" Barnes, 4-spindle,
 power feeds, back geared.
 Drill press, 36" Cin'ti, b. g., sl. ht.
 Drying machines, no dust.
 Gear hobber, No. 3 Barber-Colman.
 Grinder, No. 10 Bealy, disc.
 Grinder, No. 70 Heald.
 Grinder, 48" Yates, knife.

Hammer, 500 lb. Beaudry.
 Lathes, 14"x6" Sebastian.
 Lathe, 16"x8" American, q. c. g.
 Lathe, 18"x8" Advance, q. c. g.
 Lathes, 50 other sizes and makes.
 Milling machines, Wisconsin hand,
 No. 3 1/2 Fox, No. 25 Becker.
 Oil extractor, 26" Troy, bot. disc.
 Pipe mch., 6" Jarecki, motor drive.
 Presses: No. 4 Am. Can, straight
 side; 500 ton hyd. straightening
 Screw machine, No. 1 1/2 P. & W.,
 13/16" capacity.
 Tapping mch., Tuttle, 3" cap.
 Other machinery; send in your list.

FOR SALE BY

E. L. Esley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

24" No. 25 Foote-Burt hvy. duty.
 22" G. & E. sliding head, (2).

4 sp. Allen high speed b. b. drill.
 32" W. F. & John Barnes, sl. head.

LATHES.

14"x6" Sebastian.
 18"x8" Whitcomb Blaisdell, q. c. g.
 18"x10" Prentice, q. c. g.

20"x14" Putnam.
 21"x10" South Bend.
 30"x14" Niles.

MISCELLANEOUS.

Boring mill, 60" Bullard vertical.
 Broaching machine, No. 2 Lapointe.
 Gear cutter, No. 3 B. & S. auto.
 Grinder, No. 3 B. & S. plain.
 Grinder, 12x48" Cincinnati, cyl.
 Grinder, 8 x32" Landis plain.
 Grinder, P. & W. vertical surface.
 Grinder, 10"x26" Ott universal.
 Grinders, No. 10 Bealy 18" dbl. disc, (4).
 Hammer, 800 lb. W. W., board drop.
 Hammer, steam, 800 lb. Massillon.
 Miller, No. 33 Kempsmith prod. type
 Miller, No. 2 Milwaukee universal.
 Planer, 32"x32"x8" New Haven.
 Planer, 36"x36"x8" Betts.
 Planer, 36"x36"x12" Rockford, new.

Planer, 36"x36"x12" Woodward
 Powell.
 Planer, 38"x38"x8" Niles.
 Punch pr., No. 4 & 4 1/2 Niagara, o. b. i.
 Punch press, No. 1 Toledo, o. b. i.
 Punch pr., No. 57 Toledo, st. sd., gd.
 Punch press, No. 76 Toledo, o. b.
 Punch pr., No. 5 Toledo pl., o. b. i.
 Punch pr., No. 74 1/2 Bliss, st. sd., gd.
 Punch pr., No. 61 Bliss, o. b., reduc.
 Saw, Smith & Post cold saw.
 Screw machine, No. 6 B. & S. semi-
 auto, hand.
 Screw mch., 2"x2 1/2" Cleveland auto.
 Turret lathe, 2"x24" J. & L.
 Turret lathe, No. 2 Pratt & W.

SECOND-HAND MACHINERY

FOR SALE BY

The O'Brien Machinery Co.,

Bending rolls, 8', 8" and 6" diam.
Bolt cutter, 4" Acme, single head.
Bolt cutter, 1" Acme.
Bolt cutter, 3" Acme, single head.
Boring mill, 32" Rogers, turret hd.
Drill, 3½ spindle Baker Bros, heavy duty upright.

Drill, Allen 5-spindle, high speed.
Drill, Allen 6-spindle, high speed.
Drills, Moline heavy duty hog, (2).
Drill, radial, 4' Niles.
Hammer, 800 lbs. Bement-Miles, double frame steam.
Hammer, 1200 lbs. Bement-Miles, double frame steam.
Hammer, 2,400 lb. United Engine Co. board drop.

Lathe, 8"x108" Fitchburg Lo-Swing.
Lathe, 16"x7' Pratt & Whitney.
Lathe, 18"x9' Lehman.
Lathe, 20"x9' Lehman.
Lathe, 20"x10' Boye & Emmes.
Lathe, 20"x14' Powell.
Lathe, 23"x12' Blaisdell.
Lathe, 24"x14' Niles.
Lathe, 30"x21' Putnam.
Lathe, 48"x16' Sellers.
Lathe, 85"x18' Bement.
Miller, No. 3 Hendey plain.

119 N. Third St., Philadelphia, Pa.

Miller, No. 3½ Fox.
Miller, No. 3 Becker vertical.
Pipe machine, 4" Oster.
Pipe machine, 2" Cox, heavy duty.
Pipe machine, 2" Oster.
Pipe machine, 6" Oster.
Pipe machine, 8" Curtis & Curtis.
Planer, 32"x30"x10' Niles, milling head as well as planer head.
Planer, 42"x46"x9' Pond.
Planer, 50"x50"x18' Betts.
Press, No. 61 Bliss.
Press, No. 14-A Stoll inclinable.
Presses, No. 37½ Bliss straight side, 6" stroke; several.
Presses, No. 52 Bliss straight side, 2" stroke; several.
Presses, several Waterbury Farrell double acting, weight 2,000 lbs.
Presses, Toledo No. 53 straight sided power, 3½" stroke, (7).
Press, No. 47 Niagara, deep throat.
Shaper, 16" Hollingworth, back grd.
Shaper, 18" Hollingworth.
Shapers, 2-12" & 2-15" Springf'd.
Shapers, 12", 20" and 24" Juengst.
Slotter, 12" stroke Bement.
Turret lathe, No. 64 Bardon & Oliver, wire feed, cabinet base.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

LATHES.

18"x 8' Lodge & Shipley.
20"x 8' Lodge & Shipley.
19"x10' Springfield.
19"x12' Springfield.
24"x12' Schumacher & Boye.
24"x14' Schumacher & Boye.

25"x16' Niles.
27"x18' Springfield.
33"x20' Draper.
54"x16' Putnam.
72"x30' Farrell, triple geared.

SHAPERS.

20" Wetherell, travelling head.

PLANERS.

32"x32"x10' Sellers.

MILLERS.

No. 12 Kempsmith plain.
No. 3 Becker plain.
Owen duplex.

DRILLING MACHINES.

40" New Haven.
24" Foote-Burt.
16" Kern, high speed.

6' arm Prentice radial.
24" Aurora.

MISCELLANEOUS.

Boring and drilling machine, horiz., No. 3 Pawling & Harnischfeger.
Cold saw, 28" Q. & C.
Engine, Corliss, 12"x30", left hand.
Gear shaper, 36" Fellows.
Grinder, 5"x18" Ott plain.
Grinder, 8"x30" Modern plain.
Grinder, 10"x32" Ott universal.

Hammer, 1100 lb. Morgan, steam.
Marking machine, Mathews.
Screw machine, 1" Garvin, hand.
Screw machine, 1½" Foster, hand.
Slotter, 6" Sellers.
Turret, 16" Bardons & Oliver, universal.
Turret, No. 4 Wood.

SECOND-HAND MACHINERY

FOR SALE BY

J. L. Lucas & Son, Inc., 3 Fox St., Bridgeport, Conn.

STEAM HAMMER.

2,000 lb. Morgan & Williams double frame steam hammer, 32" stroke,
6" between housings, good condition.....\$1,500.

FOR SALE BY

Box 16, Care A. H. Hitchcock, 1220 Caxton Bldg., Chicago, Ill.

SELF-OPENING DIE HEADS.

Will sell the following Self-Opening Die Heads for less than half for single heads, or will sell the entire lot to a dealer for less than one-quarter the present prices, all good as new:—10 National Acme No. 836, 18 National Acme No. 89, 1 H. & G. No. A-14, 5 H. & G. No. C-14, 3 H. & G. No. A-1.

FOR SALE BY

Wayne Machinery Co., Fort Wayne, Ind.

Branches: 16 W. 2nd St., Dayton O. 121 S. 3rd St., Louisville, Ky.

Car wheel borer and facer, 50" Sellers.
Gear cutter, 26" Brown & S. No. 3.
Hammer, 40 lb. Bradley, cush. h.
Hammer, 250 lb. Little Giant, pwr.
Punch, 5" mult., Bertsch, 6" gap.

Shear, squaring, 36" Bertsch, 18"
gap, cap. 14 gauge, 99% new.
Shear, No. 6 Quickwork rotary, 48"
throat, 1" capacity.
See our large list on other page.

Our Guaranty: Money back if not satisfied.

FOR SALE BY

J. Bleser Manufacturing Co.,

Springfield, Ill.

Adding mche., 9-column Burroughs.
Chain hoists, Wright 2-ton h. s., new.
Cranes, Whiting overhead, hand pwr.
Crucibles, Nos. 60 and 70, new.
Crucible furnaces, Fisher, fuel oil.
Drills, 20" Barnes and Excelsior.
Drill, bench, with motor, new, \$50.
Drills, 34" and 24" Barnes, sliding hd.

Lathe, 17" LeBlond, rapid pwr., q. c.
Lathe, 20"x8" Monarch, q. c.
Millers, hand, No. 3 Burke.
Oil tank, 8' dia. x 27' long, 1000 gal.,
16" opening in center, practically
new.
Sand riddle, Champion, and motor.
Snap flasks, Arcade 10x16x4Cx3D).

FOR SALE BY

Brownell Machinery Co.,

11-13 Eddy St., Providence, R. I.

Boring mill, No. 32 Lucas horizontal,
motor drive.
Boring mill, No. 1 Lucas horiz.
Boring mill, No. 1 Cleveland.
Boring mill, No. 1 B. & S. horiz.
Drill, 26" H. & W. sens. radial.
Drill, 28" Hoefler.
Drill, 3-spindle Reed Prentice.
Gear cutter, Whiton 30x64, hand f.
Gear generator, 11" Gleason, bevel.
Gear shaper, No. 612 Fellows.
Grinder, 10x50 Norton plain.
Grinder, No. 1 Bryant chucking.
Lathe, 12"x 8' Seneca Falls.
Lathe, 4"x 6' Flather, q. c. g.

Lathe, 16"x 8' Bradford.
Lathe, 20"x 8' Whitcomb-Blaisdell.
Lathe, 20"x10" Roulsted.
Miller, No. 1 Garvin universal.
Miller, No. 1-B Kearney & T. univ.
Miller, No. 24 Brown & Sharpe pl.
Miller, No. 2 Van Norman duplex.
Planer, 17"x17"x4' Whitcomb-B.
Planer, 22"x22"x5' Whitcomb-B.
Planer, 24"x24"x6' Whitcomb-B.
Planer, 25"x25"x6' Rockford.
Planer, 30"x30"x5' Whitcomb-B.
Shaft straightener, Rockford.
Shaper, 8" Boynton & Plummer.
Shaper, 20" Ohio.

SECOND-HAND MACHINERY

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

| | |
|---|--|
| 42" Pond car wheel, motor drive. | 17" x 8' Sidney, d. b. g., q. c., new. |
| 36" x 16' Sidney, d. b. g., q. c., new. | 15" x 6' Sidney, d. b. g., q. c., new. |
| 24" x 14' Sidney, d. b. g., q. c., new. | 16" x 10' Carroll, d. b. g., q. c., new. |
| 19" x 8' Sidney, d. b. g., q. c., new. | 13" x 8' Carroll, s. b. g., p. c., new. |

SHAPERS AND PLANERS.

| | |
|--|--|
| 14", 16", 20", 24" Steptoe shapers, new. | 24" x 24" x 6' Pease planer, 1 head. |
| 7" Rhodes, precision, new shaper. | 24" x 24" x 8' Hendey planer, 1 head. |
| 16 x 16 x 42" Walter planer, 1 head. | 36" x 36" x 10' Cincinnati, 3 hds., motor. |

MILLERS.

| | |
|----------------------------------|------------------------------------|
| No. 0 Steptoe plain, b. g., new. | No. 4 Brown & Sharpe, plain, used. |
| No. 2 Garvin universal, new. | No. 1 Dow plain, new. |
| No. 2 Putnam universal, used. | No. 22 Garvin vertical, used. |
| No. 3 Burke, hand, new. | No. 24 Oesterlein plain, used. |

DRILLING MACHINES.

| | |
|---|------------------------------------|
| 48" Mueller plain, speed box, used. | 21" Superior, b. g., p. f., new. |
| 36" Drees plain, cone drive, used. | 20" Buffalo and Champion, b. g. |
| 32" Superior, s. h., b. g., p. f., new. | 16" Canedy-Otto plain, new. |
| 28" Superior, s. h., b. g., p. f., new. | 4-spindle Superior hi-speed, used. |

MISCELLANEOUS.

| | |
|--|---------------------------------------|
| Boring mill, 3" bar Binsse, hor. | Keyseaters, Nos. 2 & 4 Catlin, used. |
| Boring mill, 42" Bullard, vertical. | Pipe machines, 2", 4", 6" Oster, new. |
| Grinder, No. 1 Fraser univ., new. | Pipe machine, 8" Loew, used. |
| Grinder, 10" x 36" Norton plain, used. | Press, hyd., Watson & S., 30 tons. |
| Hack saws, 6x6 & 9x9 Peerless, new. | Punch & shear, No. 53 Beloit, new. |
| Hammer, st., 1500 lb. Bement, s. leg. | Shear, No. 46 Beloit, alligator, new. |

KELLER-MASTER



**KELLER-MADE
MASTER-BUILT**

**Riveting Hammers
Chipping Hammers
Scaling Hammers
Jam Riveters
Staybolt Riveters
Rivet Busters
Grinders
Holders-On
Sand Rammers
Valveless Drills
Corliass Valve Drills
Accessories**

Complete Catalog on Request

KELLER
PNEUMATIC TOOL COMPANY
GRAND HAVEN, MICHIGAN
BRANCHES EVERYWHERE

"New York's Greatest Clearing House—J. J. McCabe Lathe and Machinery Corporation"

**At McCabe's you get all that you expect—in used Machinery—
and MORE**

The finest kind of Tools is the Quality that makes Reliability—NOT Rebuilding them over.

30' Bed Lathe

L. H. Johnson, Jr., & Co.'s Triple-gear, Heavy Pattern, 50' swing, 30' bed, with internal Geared Face-plate, and Counter-shaft drive.

24" Slotter

Bement heavy Slotting Machine, 16" stroke. Table has all the Automatic Feeds.

"Hilles & Jones" 60" Horiz. Punch

No. 6 Heavy Horizontal Punch

60" throat, with capacity for punching about 3½" hole thru 1" plate. Arranged for motor—no motor included. Weight about 68,000 lbs. A-1 condition.

"Hilles & Jones" 14' Bending Rolls

Standard pattern—set in pyramid form with Drop-end Housing. Top Roll 14" diam., Lower Rolls 10" diam. Complete with Drop Housing—Absolutely A-1.

10-16' Swing Upright Boring Mill

"Betts Machine Co.'s" Extension type 10' adjustable to 16' Swing, with two Heads on the Crossrail, complete with Countershaft. Inspection can be made in operation near Pitts-

LATHES (USED)

Two Heavy Triple Geared Long Beds—
1-50" Swing, 60' bed, 60' between centers;
Triple Geared Face Plate 48" diam., 60" face, built by Israel Johnson, Jr., & Co.
1-50" Swing, 30' bed, 20' between centers;
Johnson.

OTHER LATHES

68" Swing, 18' bed, New Haven, Triple geared.

21" Swing, Gisholt, like new, 32" in gap.
20" Swing, Potter & Johnston, 2½" hole, geared head.
3x36" Jones & Lamson Flat Turret, Bar Equipment.
2x24" Jones & Lamson, Flat Turret, Bar and Chucking equipment.
14" Automatic Screw Machine, Hartford

GEAR CUTTERS

rests on the crankshaft. Inspection can be made still in operation near Pitts-

68" Swing, 18' bed, New Haven, Triple geared.

HORIZONTAL BORING MACHINES

44" bar, "Niles," 4" Swing, power raise to table.
 48" bar, "Bement-Miles," 6" Swing, power raise.
 44" bar, "Bement-Miles," 6" Swing, power raise.
 3" bar, "Bement," power raise.

RADIAL DRILLS

8' Arm, Dresses, Cone Drive.
 4' Arm, Dresses, Cone Drive.
 4' Arm, Cincinnati-Bickford, Speed-box Dr.

SLOTTERS

24" stroke, "Niles-B.-P." (like new), with Motor Drive, complete with Motor.
 10" stroke, "Betts," Cone Drive.

PLANERS

48"x48"x18' Pond M. T. Co., 2 heads.
 48"x48"x14' Sellers, 3 heads.
 30"x30"x 8' "Cincinnati."

MILLING MACHINES

Vertical Brown & Sharpe, No. 5, table fd, 52" with circular milling att.
 Vertical, Cincinnati, No. 2.
 Mfr. style Hendey No. 5, with qk. change.
 Plain, No. 3, Cincinnati, working surface table 48"x12".
 Plain, No. 22, Brainerd, working surface table 18"x14".
 Plain Keyseat Miller, horiz. and vertical spindles, table 60"x12", Newton Machine Tool Co.

90" Swing, 28' bed, American, Qk. Change, Triple geared.
 36" Swing, 20' bed, Putnam.
 30" Swing, 14' bed, Bridgeford Grd. Hd., Quick ch. Motor dr.
 30" Swing, 32' bed, Putnam, Geared Hd., Motor drive.
 28" Swing, 18' bed, Johnson, Qk. change, Motor drive.
 24" Swing, 12' bed, Putnam, Quick change, Taper att.
 24" Swing, 10' bed, American, qk. change, Taper att.
 20" Swing, 10' bed, American, qk. change, Grd. Hd.
 18" Swing, 10' bed, Schumacher & Boye, Taper att.
 18" Swing, 8' bed, American, Qk. change, Taper att.

DOUBLE SPINDLE LATHES

38/60" swing, 26' bed, 20' centers, McCabe, with Geared Face-plate, Chuck-jaws, etc., like new.
 26/48" swing, 18' bed, 12' centers, McCabe, with Geared Face-plate, Chuck-jaws, etc., like new.
 26/48" swing, 14' bed, 8' centers, McCabe, with Geared Face-plate.
 26/48" swing, 12' bed, 8' centers, McCabe, with Plain Face-plate.

DRIVING-WHEEL LATHE

80" Swing, with Quartering att., Bement, Dbl. hd., turns both wheels same time.

LO-SWING LATHE

34"x60" Fitchburg, complete equipment.

TURRET LATHES

28" Swing, Pond, Rigid type, 44" hole, rapid traverse to Turret.

GEAR CUTTERS

36" Gould & Eberhardt, for spur and bevel gears.
 26" Fellows Gear Shaper.
 56" Eberhardt Bros., for sp. 4.

PUNCHES AND SHEARS

Horizontal Punch, 60" gap, Hilles & Jones, wt. 65,000 lb., arr. for Motor, no motor.
 Punch and Shear, Single End, 60" gap, weight 32,000 lbs.
 Punch and Shear, Single End, 42" gap, with Motor, Hilles & Jones.
 Punch and Shear, Double End, 36" gap, belt drive, Long & Allstatter.
 Portable Punch, Pels.

AIR RIVETER

19" gap, Albree, capacity 14" rivets.

GRINDERS

Plain Roll Grinder, Table 66"x18", takes 36" centers, Bridgeport, like new.
 Universal, Landis, Swings 16", 60" centers.
 Universal, Landis, Swings 10", 30" centers.
 Universal, Iroquois, Swings 12", 36" centers.

BENDING ROLLS

14' 2" between housings, drop-end Hilles & Jones top roll 11" diam., two lower rolls 8" diam., (one grooved), center support for lower rolls, friction clutch pulley dr.
 10' 2" bet. housings, drop-end, top roll 104" diam., two lower rolls 8", wt. a. bt. 20,000 lb. Motor or belt drive.

HYDRAULIC RIVETER

8' gap, Bement-Miles. Bull Riveter, with piston and ram for accumulator. Over-head Crane, Hoist, etc., capacity for driving up to 14" rivets.

J. J. McCabe Lathe & Machinery Corporation, 149 Broadway, New York

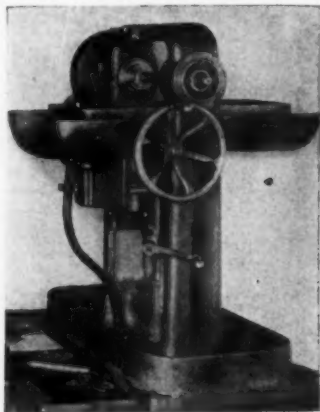
"The RELIABILITY of McCabe's Used Machinery Is Known the World Over"

LUCAS MACHINERY SERVICE

TO CLOSE THEM OUT WE OFFER:

**20—Type "A" Briggs Milling Machines
At \$275 each, Subject to Change in Price**

Each one is in fine condition and has counter-shaft, wrenches, and a new arbor. New oil pumps will be furnished at \$20.00 each extra.



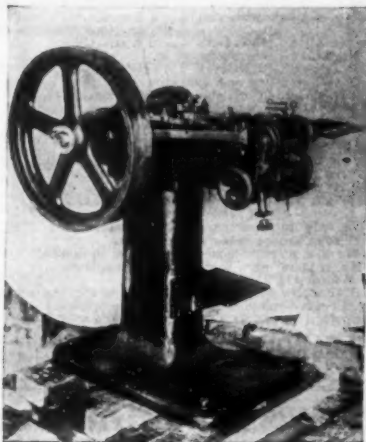
DIMENSIONS

Traverse feed of table.....16"
Table Surface24"x8"
3 T slots for $\frac{1}{2}$ " bolts"
Distance between housings ..12 $\frac{3}{4}$ "
Cutter space on arbor10"
Maximum distance table to center
of arbor12"

Arbor for No. 11 B. & S. taper
Spindle driving gear.....14"x2"
Ratio of gearing4 to 1
Weight.....2,300 lbs.
Floor space42"x52"
8 changes of feed to table.

J. L. LUCAS & SON, Inc.
3 Fox Street, BRIDGEPORT, CONN.

LUCAS MACHINERY SERVICE



21 No. 0 Farrel Foundry Solid Die Single Stroke Headers

| | | | |
|----------------------------------|---------|--------------------------------|--------------|
| Rated cap., dia. of blank..... | 1 1/8" | Dia. of feed rolls..... | 4 1/4" |
| Rated cap., length of blank..... | 1 1/8" | Dia. and face of flywheel..... | 22" x 3 1/2" |
| Extreme length of feed..... | 1 1/2" | R. P. M. of flywheel..... | 200 |
| Stroke of heading slide..... | 2 1/2" | Floor space..... | 29" x 41" |
| Dia. of heading die..... | 1 3/16" | Weight of flywheel..... | 110 lbs. |
| Dia. of cut-off die..... | 9/16" | Weight of machine..... | 1040 lbs. |
| Dia. of heading punch..... | 13/16" | | |

All in exceptionally fine condition. Price each \$400.
F. O. B. Bridgeport, Conn.

J. L. LUCAS & SON, Inc.
3 Fox Street, BRIDGEPORT, CONN.

GOOD TOOLS AT ATTRACTIVE PRICES

MILLING MACHINES.

Rockford No. 1 $\frac{1}{2}$ plain, latest.
Becker No. 25 plain, with vise and c. s.
Whitney No. 6 hand, power feed.
Becker No. 5-C vert., reg. equip.

Cincinnati No. 3 vert., hi-power, arr. m. d.
Burke No. 3 hand, on column, d. i. att., collets.

ENGINE LATHES

Young 12"x5", elevating rest, with chuck.
Blaisdell 13"x6" and 16"x6", elev. rest, with chucks.
Flather 14"x6", compound rest, regular equipment.
Reed 14"x6", compound rest, taper attachment, with chuck.
Reed 18"x12" plain rest, semi-quick change.
Lathe & Morse 20"x10" raised to 24" elev. rest.
Reed 20"x10" compound rest, 1 $\frac{1}{2}$ " hollow spindle, chuck.
Reed 22"x12" compound rest, 1 $\frac{1}{2}$ " hollow spindle.
Blaisdell 26"x12", compound rest, heavy spindle.
Perkins 40"x18", compound rest, with two chucks.

SCREW MACHINES

Wood No. 4, 1 $\frac{1}{2}$ " cap., friction grd. head latest type.
Garvin 1" cap., hand, complete set of collets.
Garvin No. 2, s. p., plain head, 1 $\frac{1}{2}$ " cap., reg. equipment.
Foster No. 1, 1 $\frac{1}{2}$ " cap., hand, regular equipment.
Pratt & Whitney 1 $\frac{1}{2}$ "x18", hand.
National Acme No. 515, 9/16" capacity, automatic, reg. equip.
Gridley 2 $\frac{1}{2}$ " cap., 4-spindle auto., standard equipment.

FLATHER 18" SINGLE GEARED CRANK SHAPER.

LYND-FARQUHAR CO., Dept. G Quality Machine Tools
BOSTON 9, MASS.

HIGH GRADE Machine Tools RE-BUILT

PUNCHES

No. 6 L. & A. double end.
No. 6 Beatty, 48" throat.
No. 15 Williams-W, 30" throat.
No. 11 Whiting, 12" throat.

PRESSES

2C and C84 Ferracete.
No. 744 Bliss, plain crank.
No. 20 Bliss, o. b. inclinable.
No. 857 Toledo r. & p. press.

LATHES

21x10 LeBlond, quick change.
24x12 Advance, quick change.
24x14 Schumacher, q. change.
18x14 LeBlond, l. change.
19x12 Greaves Klusman, l. c.
18x8 American, quick change.
20 smaller lathes.

MILLING MACHINES

Nos. 2, 3 & 4 Cincinnati plain.
No. 3B Brown & Sharpe plain.
No. 3B Milwaukee plain.
No. 2G Hendey full universal.
No. 3 H. LeBlond full univ.

GEAR CUTTERS

No. 13 Brown & Sharpe, s. & b.
No. 1 S. & S. gear hobber.
No. 2 S. & S. gear hobber.
30" Flather auto. spur.
36" Cincinnati auto. spur.
48" Newton gear hobber.

PLANERS

24"x24x6' Gray, 1 head.
32"x32"x10' Pond, 2 heads.

DRILL PRESSES

30" Drees, plain radial.
48" Fosdick plain radial.
20", 22", 24", 30", 36" and 42" drills.
1-No. 1 Baush 8-sp. multiple.

MISCELLANEOUS

Band saw, metal, 30".
Boring mill, 72" Betta vertical.
Grinder, No. 60 Heald, cylinder.
Grinder, No. 23 Whitney, cyl.
Keyseater, No. 2 Davis.
Moulding mchs., Tabor, (6)
Sprue cutter, No. 141 Toledo.

Send for our latest stock list

JONES MACHINE TOOL CO. 435 E. Pearl St.
Cincinnati, Ohio

Back to Lower Prices

In order to avoid moving our stock to our new Wareroom, we are offering our entire stock of used Machines and many new Tools at sacrifice prices. Do not ask us for a list but specify exactly what you want and we will quote you by return mail or wire, if necessary. The following are a few Machines picked at random from our stock:

LATHES

9" to 13" Barnes, h. s., cp. r., new.
10"x8" Summit, nearly new, (5).
13-15-16 and 18 O. & S., h.s., c.r., new.
18"x 8" Fitchburg, hol. spdl., cp. r.
20"x10" Hamilton, double back gear.

24"x12" Fitchburg.
24"x12" Fay & Scott.
25"x14 Schumacher & Boye.
8"x60" Fitchburg Lo-Swing.
21" and 24" Gisholt, turret.

TURRET LATHES and SCREW MACHINES

24" Steinle, 64" hol. spdl., grd. hd.
14" Tilted turret hand screw mche.
2x24 & 3x36 J. & L., dbl. equipment.
14" S. & K. hand screw machine.

No. 2 Warner & Swasey hol. hex.
Nos. 52, 53 & 56 National Acme.
21" and 24" Gisholt.
No. 0 B. & S. Automatics, (2).

SHAPERS

14" Niles, traveling head.
14" Smith & Mills, crank.
16" Barker, back geared crank.

24" Walcott, geared.
20" Smith & Mills, geared.
16" Springfield, crank, back grd.

PLANERS

24x24x 6' Hendey.
24x24x 6' Pease.
36x36x10' Sellers, 2 heads.
44x44x12' Pond, 4 heads.
48x48x16' Bement-Miles, 2 heads.

54x54x16' Sellers, 4 heads.
60x60x17' Betts, 2 heads.
60x60x20' Sellers, 4 heads.
66x66x20' New Haven, 2 heads.
84x84x32' Putnam, 4 heads.

PRESSES

No. 856 Toledo, 36" stroke, 15,000 lbs.
Perkins, dbl. crank, 16x24 bolster.
No. 35 Niagara, Stiles type, (2).

No. 3 Robinson, 4300 lbs., o. b. i.
No. 6-A Willard 3400 lbs. inclinable.
No. 1 1/2 Robinson 1500 lbs. inc., (3).

DRILLS and RADIALS

Henry & Wright sgl. spdl., high spd.
34" Canedy-Otto plain, new.
Sensitive 1, 2, 3, 4 and 6 spindle.

24", 26", 28" and 32", sliding head.
3" Morris plain, gear box drive.
4 1/2" Prentice, gear box drive.

Six new standard makes 20" Drills, each \$123.50

MILLING MACHINES

No. 25 Becker plain, (3).
Ames Lincoln type, 10"x40" table.
No. 2 Kempsmith universal.
No. 3 Brainard, 30x7 table.

No. 1 1/2 B. & S. plain.
No. 2 H Brown & Sharpe plain.
Briggs type "A" high duty, 24x8 table.
No. 32 Kempsmith Lincoln type, (3).

GRINDERS

No. 78 W. & M. wet surface.
10x24 Norton plain.
Capital, internal, practically new.

Landis 10x24 universal.
Litter 10x20 universal.
36" and 66" Yates plate.

MISCELLANEOUS

Band saws, metal, Klemm, (2).
Boring mill, 12", 2 swivel heads.
Brake, 8" Keene, for 16 gauge.
Compressors, 9x8 and 12x10, new.
Gear cutter, G. & E. 36".
Gear cutter, Whiton 36"x9" face.
Hammers, 40 lb. Bradley, helve, (2).
Hammer, Toledo, 5,000 lb. fric. brd.
Hammer, Canton 6,000 lb. b.g. drop.

Motors, 1 to 50 h.p., 3 ph., 220 v., G.E.
Oil groover, Garvin, nearly new.
Oil separator, Springfield.
Pipe machines, 2", 4", 6" & 12".
Pumps, Gould triplex, 6"x8" & 7"x8".
Punch & shears, 1/4 thru 1/2, 12" throat.
Riveter, high speed, 3" capacity.
Shear, 5" Robinson, for 10 gauge.
Shear, 8" Robinson, for 18 gauge.

Osborne & Sexton Machinery Co.

Columbus, Ohio

Dayton Office: 1118 Lindsey Building, Phone Main 1524

Surplus Machine Tools For Sale

- 1—Cincinnati Planer, heavy duty, 36x36x12 ft., 4 heads, two speed gear box drive.
- 1—Cincinnati Planer, 36x30x14 ft., 3 heads, two speed counter-shaft.
- 1—Cincinnati Plain Milling Machine No. 4, cone pulley drive, with vertical attachment.
- 1—Whitcomb-Blaisdell hollow spindle Lathe, 16x8, quick change, triple back geared.

These tools are fully as good as new. Some of them have been in operation only about three months. All machines can be inspected in operation.

Julius Wegner Machine Works, Inc.
63 Mills Street Astoria, L. I., N. Y.

A Few Items of Our Large Stock

- 4—Gisholt Mfg. Lathes, 6" hollow spindle.
- Conradson Geared Head Lathe, 28"x14'.
- Bridgeford Geared Head Lathe, 27"x14'.
- 3—Bridgeford 27"x9" d. b. g., q. c. g. Lathes.
- 2—Bridgeford Axle Turning Lathes.
- 24"x10' Lodge & Shipley Lathe.
- Monarch 16"x6", Bradford 16"x6", LeBlond 17"x6".
- 3—Fitchburg L.O.-Swing Lathes; Landis Grinder.
- Whitcomb Blaisdell, Fay & Scott, and Putnam Lathes.
- 2—Fitchburg Model "B" 12"x36" Cylindrical Grinders.
- Yates No. 275 Grinders, 36" and 48"; No. 2 Am. Surface.
- Demco High Speed, and 20, 22 & 24" Drill Presses.
- Briggs Type "B" Milling Machine, traverse of table 72".
- Kemp Smith No. 1 and Becker No. 25 Plain Millers.
- 24" Automatic Tool Works Shaper.
- 20" and 24" Drills; Foster Screw Machines.
- 10—Hendey No. 4 Lincoln Type Milling Machines.
- 30—Fox No. 34 and Bristol No. 0 Milling Machines.
- 10—Becker No. 7H Millers; Foster Thread Millers.
- Hurlbut-Rogers 4" and Davis 6" Cutting-off Machines.
- Allen High Speed Drills 4, 5 and 6 spindle.
- New Williams & White No. 25 Bulldozer.
- Lea Simplex No. 18 Cold Saw; Marvel Hack Saws.
- No. 3 High Speed Riveting Hammer.
- Corliss and Automatic Engines; Toledo Spot Welder.
- 4—G. E. Motors, 3 Ph., 60 Cy., 5 & 25 H. P.
- 7—20" Lathe Chucks, 10—Air Chucks and 50—Drill Chucks.

McDonald Machinery Co. 712-714 N. Main St.
 ST. LOUIS, MO.

**Fill Up the Gaps
In Your Plant
From Our List**

of

**Standard Machine Tools
Hydraulic Tools
Plate Tools
Riveters
Rolls
etc.**

Write us about your needs!

We Rebuild the Tool—We buy Modern Tools

THE NOTCH & MERRYWEATHER MACHINERY CO.

CLEVELAND

DETROIT

CINCINNATI

PITTSBURGH

Grand Rapids Specials

Broaching machine, keyway,
No. 4 Burr.
Broaching machine, No. 2 J. N.
LaPointe.
Cut-off mch., No. 4 Nutter-B.
Cut-off mch., No. 4 Cochrane-B.
Drill, 20" Barnes, all-g geared.
Drill, 10-sp. Grand R. mult.
Grinder, 6-A Bryant, chucking.
Grinder, Norton universal cut-
ter and tool.
Grinder, Cincinnati universal
cutter and tool.
Lathe, 18" x 10' Schumacher-B.
Lathe, 24" x 10' Schumacher-B.
Marking mch., No. 3 Dwight-S.
Pipe mch., No. 300-A Oster.
Planer, 30" x 30" x 8' Pond.
Press, arch, No. 164 Consolidated
Press, double crank geared,
No. 164 Consolidated.

Profiler, No. 3-H Becker.
Punch, mult., No. 3 Kane & R.
Punch & shear, No. 54 Beloit.
Radial, wall, 24" No. 51 Canedy-O.
Radial, 3' Fosdick Holloway.
Radial drill, 3' Dreses.
Riveting hammer, No. 3-A High
Speed, large throat.
Sand blast outfits, A-6 Pang-
born, (3).
Screw mch., 3" Cleveland auto.
Shaper, 14" Davis, crank.
Shear, power sq., 96" Oil, 16 ga.
Spline miller, 4" P. & W.
Tilted turret lathe, No. 3 Wood.
Turret lathes, 2x24 J. & L.
Turret lathe, 3x36 J. & L.
Turret lathe, No. 3 B. & O.
Turret lathe, No. 5 Foster.
Wire weaver, Smurr & Kamen
semi-automatic.

McMullen Machinery Company

"Everything in Shop Equipment"

Grand Rapids, Mich.

Fully Guaranteed Used Equipment:-

1—Whiton Centering Machine.
2—24" Barnes vert. drill bk. grd.
1—4 spindle Guarantee Drill.
1—No. 1 Hoosier Heavy Duty
Drill (new).
1—20" 6-spd. Barnes Gang Drill.
1—Sigourney Plain Bearing
Drill, capacity 8".
1—Pilton Plain Bearing Sensi-
tive Drill, 5/16" capacity.
1—D-4 Colburn Drill.
1—22" 4 sp. Barnes Gang Drill.
1—No. 17 Foote-Burt Drill.
1—3' Cincinnati Bickford Radial
Drill.
1—No. 12 Modern Grinder.
1—No. 3 Brown & Sharpe Auto-
matic Gear Cutter.
1—No. 13 B. & S. Light Pattern
Spur & Bevel Gear Cutter.

1—No. 17 Besly Disc Grinder.
1—6x32 Norton Grinder.
1—36" Fellows Gear Shaper.
1—3-sp. G. & E. Gear Rougher.
1—12x36 Cincinnati Plain cylin-
drical Grinder.
1—No. 60 Heald Grinder.
1—20x8' Cisco Lathe (new).
1—30x14' Boye & Emmes Engine
Lathe.
1—No. 3-A High Spd. Hammer.
3—34" Gridley Auto, sgl. spd.
1—24" Gridley Auto., four spd.
Nos. 52 and 55 National Acme
Automatics.
Cleveland Automatics as fol-
lows:—8", 8", 2", 24", 34".
1—No. 2 Mitts & Merrill Key-
seater (new).
1—No. 2 Davis Keyseater.

M. J. Walsh Machinery Co.
141 Sycamore St., Milwaukee, Wis.

SIMMONS

MILLERS

- | | |
|---|------------------------------------|
| No. 2 LeBlond plain. | P. & W. 6"x14" thread miller. |
| No. 2-S Cincinnati grd. hd. univ., (4). | No. 6 Whitney & Standard hand |
| No. 3 Cincinnati hi-power plain. | millers, (25). |
| No. 3-S Cincinnati grd. hd. univ., (8). | No. 3 Cincinnati heavy duty geared |
| No. 3 Cincinnati hi-power vertical. | head vertical, (5). |

BORING MILLS

- 24" Bullard New Era Type Vertical Turret Lathe.
 34" Bertram Vertical Turret Head Boring Mill.
 36" Bullard New Era Type Vertical, cutting lubricating system.
 37" Bullard Boring and Turning Mills, (2).
 42" Bullard New Era Type Vertical, 4-jaw chuck, complete.
 12' Bement Extra Heavy Boring and Turning Mill, 2 swivel heads.

PLANERS

- 30"x30"x18' Cincinnati, two heads.
 36"x36"x20' Woodward-Powell, four heads, rev. type motor.
 42" Newton Rotary, belt or motor drive.
 42"x42"x12' Simmons openside, two heads, NEW.
 48"x48"x28' Cincinnati, two heads, NEW.
 48"x48"x20' Ridgeway High Duty, four heads.
 60"x60"x20' Woodward-Powell, 4 heads. 35 h. p. motor rev.

RADIAL DRILLS

- | | |
|---------------------------------------|---------------------------------------|
| 6' Reed Prentice pl., tapping attach. | 4' Bement-Miles plain. |
| 6' Pond plain, belt drive. | 26" Sibley sliding head back geared |
| 4' Hammond high speed, NEW. | drills, (4). |
| 4' Bickford plain, complete. | 36" Cincinnati, bk. grd., sliding hd. |

LATHES

- 64"x26' Putnam heavy duty, with d. c. motor.
 60"x29'-56' Niles-Bement-Pond, motor drive, NEW, (4).
 48"x29'-56' Niles-Bement-Pond, motor drive, NEW, (8).
 42"x20' Niles-Bement-Pond, motor drive.
 42"x18' Bement heavy duty, cone driven.
 36"x34' Bridgeford Geared Head, q. c. g., NEW, (6).
 36"x18' Putnam heavy duty, triple geared.
 30"x12' high duty American, geared head, motor drive, with motor, (4).
 27"x24' LeBlond heavy duty, d. b. g., q. c. g., NEW, (8).
 27"x18' LeBlond heavy duty, q. c. g., with motor, (8).
 24"x10' high duty American Geared Head, motor drive, (8).

GRINDERS

- | | |
|-----------------------------------|--|
| 14"x96" Norton plain, NEW. | No. 1 Norton univ. tool & cutter, (2). |
| 18"x96" Norton plain, complete. | No. 2 Wilmarth-Morman surface. |
| Brown-Sharpe planer type surface. | No. 5 Brown & Sharpe universal. |

MISCELLANEOUS

- 96"-84" and 72" Gould-Eberhardt Gear Hobbers.
 No. 2-A Warner-Swasey Turret Lathe.
 Double End Punching and Shearing Machine, Niles-Bement-Pond, 14" cap.
 8" Saunders Pipe Machine, with dies, belt driven.
 15" Hendey Friction Driven Shaper.
 16" Milwaukee Back Geared Crank Shaper.
 24" Hendey Friction Driven Shaper.
 32" Cincinnati High Duty Shapers, NEW, (9).
 30-Ton Eight Wheel Orton-Steinbrenner Steam Operated Standard Gauge,
 Locomotive Crane, 82' boom.
 Steel Lockers, practically brand new, (600).

Simmons Machine Co., Inc.

Albany, N. Y.

801 Singer Bldg., N. Y., 86-88 Exchange St., Buffalo, N. Y.

Second-Hand Machinery

BORING MILLS.

Four 24" Bullard vertical turret lathes, latest pattern, 4-jaw chuck.
 Four 30" Bullard vertical boring mills, 3-jaw chuck.
 30" Colburn vertical, belt feed, 3-jaw chuck, swivel turret head.
 50" Baush vertical, two swivel heads, plain table.
 Binsse horizontal, 4" bar.
 No. 1 Pawling & Harnischfeger horizontal.

DRILLING MACHINES.

Four No. 117 Moline heavy single spindle "Hole Hog."
 No. 310 Baker Bros. high speed heavy type, with compound table.
 30" Wm. E. Gang plain radial, swinging table.

GRINDERS.

No. 70 Heald internal. | No. 17 Besly disc, NEW.

ENGINE LATHES.

24"x12" Reed, 4-step cone, compound rest.
 32"x16" Fay & Scott, with power feed turret on shears, fine condition.
 54"x24" American, triple geared into face plate, good condition.

PLANERS.

38"x38"x 8" Niles, 2 heads. | 66"x66"x17" Harrisburg, 2 hds.
 60"x60"x12" Gleason, 3 heads.

PRESSES.

Four No. 27 Swaine inc., new. | No. 8 Cleveland inclinable, new.

MISCELLANEOUS.

Keyseater, No. 2 Baker. | Screw machines, 1" Smith, plain
 Miller, No. 4 Hendey Lincoln. | head, wire feed, (3).
 Pipe machine, 3" Stoeber. | Turret lathes, 21" Gisholt.

Marshall & Huschart Machinery Co.
 17 S. Jefferson St., Chicago, Ill.

SPECIALS Immediate Delivery

1-59¼ Toledo Straight Side Press, dbl. grd., 12" str., tie rod frame, weight 70,000 lbs., spring pressure attachment.

1-59 Toledo Straight Side Press, double geared, 12" stroke, weight 50,000 lbs.

1-No. 666 Toledo Knuckle Joint Embossing Press, cap. 1,000 tons.

1-No. 14 Toledo Horn Press, fly-wheel type, table included.

1-No. 2 Toledo Inc. Fly-wheel.

1-No. 3 Toledo Inc. Fly-wheel.

1-No. 27 Bliss Knuckle Joint Embossing Press, cap. 1,000 tons.

1-No. 2-W Bliss Wiring Press.

1-No. 69-N Bliss Cam, fly-wheel.

1-No. 77½ Bliss Straight Side, double grd., 8" stroke, tie rod.

1-76½ Bliss Straight Side Press, 8" stroke, tie-rod.

1-Long & Allstatter Mult. Punch, 7" shaft, 96" between uprights.

1-D-66 Ferracute Reducing Press.

1-D-65 Ferracute Reducing Press.

1-No. 72 Consolidated Press.

1-No. 65 Consolidated Press.

1-28" Gould & Eberhardt Shaper.

1-No. 4 Williams-White Bulldozer.

1-28" Smith & Mills Shaper, single pulley drive.

D. C. Oviatt & Co., 401 Garfield Bank Bldg.,
 CLEVELAND, OHIO
 Presses, Sheet Metal and Can Machinery.

Priced To Sell Now

BORING MILLS

100" Betts, 3 heads, like new.
75" Betts heavy, modern.
60" Niles-Bement-Pond, hvy., single pulley drive.
60" Bickford, standard, 2 heads, low price.

48" Colburn, 2 heads, modern.
36" Bullard Vertical Turret.
8-24" Bullard Vertical Turret.
34" Horizontal Universal, belt driven.
4" Espen-Lucas Horiz., floor type.
3" Betts, Horizontal, knee type.

DRILLING MACHINES

8' Niles Plain Radial.
6' Baush, Plain Radial, like new.
6' Bickford, Semi-Universal Radial.

4-28" Aurora Upright, s. h., t. a.
5' Niles-Bement-Pond, motor driven.
4' Gang, gear box drive.

DRILLS—Multi-Spindle

4—(NEW) Aurora 28", s. h., b. g., p. f., auto. stop.
6 spindle Baush, 1" capacity.
3 & 4 spindle Barnes, 20" gang.

2-sp. Foote-Burt heavy rail type.
4 & 6 spindle Rockford, auto. feed.
4 & 6 spindle Allen, sensitive.

LATHES

60"x20' Fifield, D. C. Motor Drive.
52"x22' New Haven triple geared, pulley drive.
60"x17' New Haven Pulley.
36"x14' Putnam triple geared.
36"x12' Pond triple geared.
30"x12' Johnson.

28"x18' Johnson.
20"x8' & 10' American.
20"x8' Lodge & Shipley.
14"x8' Mulliner tool room.
14"x8' Monarch.
12"x5' P. & W.
10"x4' Seneca Falls.

MILLING MACHINES

8—No. 5C Becker Verticals, new, price right.
No. 3 LeBlond, plain, high duty.
No. 5 Becker-Brainard Plain.
No. 2 Kempsmith Universal.
50"x8' Ingersoll Slab.

No. 25 Becker Plain.
No. 2 Hendey Norton Plain.
No. 14 Hendey Norton Universal.
No. 2 Van Norman Duplex.
31"x5' Newton Vertical Slab.

PLANERS

84"x84"x18' Sellers, 3 heads, belt driven.
48"x48"x14' Powell, 4 heads, reversible motor drive, complete with electrical equipment.
48"x48"x18' Bement-Miles, 4 heads, belt driven.

42"x42"x12' Pond Machine Tool Co., 2 heads, belt driven.
36"x36"x12' Niles-Bement-Pond, 3 heads.
30"x30"x10' Flather, 2 heads, belt driven.
30"x30"x8' Gray, 3 heads, parallel dr.

PRESSES

No. 55 Adriance S. A.
No. 512 Bliss, triple action.

No. 1 Farrel straight side, 8" stroke.
D. D. 4 Ferracute, D. A., roll feed.

SHAPERS

2-16" Newark, box table and vise.
4-15" Smith & Mills, box table and vise.

4-15" Hendey, box table and vise.
3-48" Morton, extra hvy., draw-cut.
15" Fitchburg, traveling head.

MISCELLANEOUS

10' Bement Boiler Plate Rolls.
15" Betts heavy type slotter.
8" New Haven Slotter.

Sellers heavy Punch, 2" capacity.
No. 26 Buffalo Slitting Shear (new).
Newbold Rotary Shear, 4" cap.

Graves Machinery Exchange

Warehouse and R. R. Siding:
Johnston Ave. & Monitor St..
Jersey City, N. J.

Offices: Suite 482
50 Church St., New York City
Telephone: Cortlandt 665

Harris Brothers Co.

1475 W. 35th St., Chicago, Ill.

Turret Lathes and Screw Machines

24" Gisholt with 4 way turret tool post on carriage, hex turret, on bed, with power rapid traverse, taper attachment, screw cutting 2 step cone, triple geared, 6 $\frac{1}{2}$ " hole in spindle (10).
24" Steinle; Same (1).
28" Pond Rigid; same (2).

Grinders

16x60 Landis crank shaft.
12"x36" Fitchburg plain, (3).
6x32 Norton, plain cylindrical.
Fitchburg, Low-Swing Lathe, 8" swing, 96" centers, (3).
Gisholt Wet Tool Grinder.

Hammer and Punch Presses

No. 55 D. G. G. Ferracute, sided, single action, 16" stroke. Weight about 16000 lbs. 70 tons pressure.
No. 56 D. G. G. Ferracute, St. Sided, single action, 16" stroke. Weight about 22,000 lbs. 100 tons pressure.
No. 201, Ferracute, St. Sided 10" str. Weight about 44,000 lbs. 200 tons pressure.
Erie 800 lbs. single frame, (3).

Drill Presses and Boring Machines

8-spd. Baush, univ. adjustable 20" circular head, capacity 1".

Footo-Burt 2 spd. adjustable vert.

Planers, Shapers and Slotters

20" Pedrick & Ayer, 2 tables.
12" Putnam rotary table slotter.

18" Betts rotary table slotter.
18" & 20" Niles rotary table slotters.

Milling Machines

36" x 24" x 20' Ingersoll horizontal planer type, with 2 heads on cross rail, with 4 spindles, new.
24" x 24" x 12' Ingersoll horizontal slab milling machines (6) new.
No. 4 Hendey Lincoln milling machines (250).
No. 7 H. Becker Lincoln milling machines (250).
No. 6 Whitney hand (10).
No. 22 Garvin, vertical.
No. 5 Becker, vertical.
No. 3 Brown & Sharpe, vertical.
No. 2 Brown & Sharpe, plain.
No. 3 Brown & Sharpe, universal.
No. 3 Pedrick & Ayer, universal.

Miscellaneous

Bending roll, 6' New Doty, capacity 1" plate.
Bolt cutter, 1" Acme, 4-spindle.
Centering machine, 9" Whiton.
Cutting-off machines, for 2 $\frac{1}{2}$ ", 3", 4" & 6" pipe and shafting.
Motors, 8 Westinghouse. 250 h. p., 440 volt, 60 cycle, 3 phase, speed 514 r. p. m., Type C.C.L. squirrel cage, with base, with starters.
Nut facing machines.
Nut tapper, Acme 4-spd. 1 $\frac{1}{2}$ " vert.
Pipe threaders, Curtis 2 $\frac{1}{2}$ " 4 & 6.

Write for Industrial Bulletin No. 204

Second Hand Machine Tools

BORING MACHINES.

4" bar Detrick & Harvey floor type.
No. 3A Universal horiz., table type.
No. 2 Beaman & Smith, floor type,
4" spindle, motor drive.

24" bar Bement-Niles horizontal.
No. 1-3" Lucas horizontal.
34" Colburn vertical, turret head.
35" Niles vertical, 2 heads.

DRILLS.

14" Sensitive, two tables.
3-sp. Henry & Wright sens. b. b.
3 spindle Taylor & Fenn sensitive.
20" Prentice Bros. sliding head, b. g.
23" Rockford, tapping att.
24" Pratt & Whitney, b. g. & p. f.
42" Cinn.-Bick. sliding head, b. g.,
p. f., cone drive, tapping att.
No. 1 Rockford horizontal.

20" Baker Bros. style M, 4 h. p. mtr.
No. 310 Baker Bros. heavy duty.
6-sp. Hendey, pwr. feed to each spdl.
No. 30-12 spindle Baush multiple.
No. 12-8 spindle Natco multiple.
No. 22-16 spindle Natco multiple.
4" Bickford plain radial.
42" Dreses plain radial.

GRINDERS.

3"x18" Norton, plain cylindrical.
6"x32" Norton, plain cylindrical.
10"x48" B. & S. plain cylindrical.
10"x30" Landis plain cylindrical.
No. 16-12"x120" Landis plain cyl.
18"x96" Norton plain, self contained
motor drive.
No. 3 Modern universal.
No. 2-12x40 Modern universal.
10" Garrigus rotary surface.

B. & S., oscillating ball race.
No. 11 Rivett oscillating.
No. 5 Rivett hand feed oscillating.
No. 34 Van Norman internal.
No. 6 Rivett internal.
20" Besly disc.
No. 6 A Bryant internal.
18" Ney double disc.
No. 60 Heald cylinder.

LATHES.

No. 5 Rivett bench, slide rest.
11x5 Seneca Falls, c. r., p. c. f.
13"x6" Willard c. r., p. c. f.
14"x8" Reed c. r., p. c. f., t. a.
16"x8" Flather, q. c., c. r., p. c. f.
18"x8" Prentice Pros. geared hd., ck.
18"x8" Hendey c. r., p. c. f., tap. att.
20"x19" Reed, c. r., p. c. f.

22"x8" Schumacher-Boye, c. r., p. c. f.
22"-24"x8" Lodge & Shipley selective
head, manufacturing.
28"x12" Putnam, c. r., d. b. g.
32"x14" Hamilton, c. r., p. c. f.
38"x20" New Haven, c. r., p. c. f.
56"x24" Wood & Light, c. r., p. c. f.

MILLERS.

No. 14 Garvin plain.
Rivett hand, precision.
No. 2 Cincinnati plain, all feeds.
No. 3 Cincinnati plain, cone drive.
No. 4 Cincinnati plain, all feeds.
No. 2-A Kempsmith plain, b. g.

No. 1 Cincinnati univ., cone drive.
No. 14 LeBlond univ., motor drive.
No. 14 Cincinnati univ., cone drive.
Nos. 3 & 4 Cincinnati high pwr. vert.
No. 4-B Becker vertical.
No. 12 B. & S. Manufacturing.

TURRET MACHINES.

16" Acme univ. friction back gear.
20" Steidle heavy duty, geared head.
30x10 Fay & Scott univ. turret lathe.
24x10 Lodge & Davis turret.
24" Gisholt turret, 6" hollow spdl.
Fay automatic turret lathe.
2"x24" J. & L. flat turret, bar equip.

3"x36" J. & L. chuck or bar equip.
4" Bardons & Oliver turret, motor.
No. 24 Garvin screw machine.
No. 3 Windsor w. f. screw mach.
3"-4 spindle National Acme auto.
14"-4 spindle National Acme auto.

MISCELLANEOUS.

Broaching mach., Nos. 4 & 5 J. N.
Lapointe.
Compressor, 8x8 Clayton single air.
Gear cutter, 36"x9" B. & S. spur.
Pipe mche., No. 84 Curtis & Curtis.
Planer, 24x24x6 Flather, one head.
Planer, 30x30x8 Pond, 2 heads.
Planer, 36x36x12 Cincinnati, 4 heads.

Planer, 36x30x14 Cincinnati, 3 heads.
Planer, 48x48x15 Sellers, 3 heads.
Planer, 60x48x14 Gleason, 2 heads.
Profiler, No. 13, P. & W., 1 spindle.
Punch & shear, 10" throat, 1" cap.
Shaper, 14" P. & W. crank.
Shapers, 15" and 24" Hendey friction.

HENRY PRENTISS & CO.

INCORPORATED

NEW YORK, N. Y.

Warehouse, JERSEY CITY

S-T-O-P These Tools are Priced Right

LATHES

| | |
|---|---------|
| 3-14"x 6' Monarch double back geared Engine Lathes, quick change geared feeds, equal to new. Price, each..... | \$ 500. |
| 4-14"x 6' Flather single back geared Engine Lathes, quick change geared feeds, equal to new. Price, each..... | 500. |
| 3-12"x 5' Reed Prentice plain change geared Engine Lathes, equal to new, each..... | 450. |
| 2-14"x 6' Hendey tool room Engine Lathes, with taper attachments, fairly good condition. Price, each..... | 450. |
| 4-36"x14' Lodge & Shipley geared head Engine Lathes, face plate drive, like new, each..... | 4500. |

PRESSES

| | |
|--|---------|
| 1-59 Toledo Punch Press, like new..... | \$6000. |
| 1-59 1/2 Toledo Punch Press, like new..... | 7000. |
| 1-69 Toledo Inclined Punch Press, with cam drawing..... | 800. |
| 5-No. 5 Toledo Inclined Punch Presses, like new, each..... | 800. |
| 1-No. 11 Perkins Geared Punch Press, equivalent to 76 Bliss..... | 700. |

GRINDERS

| | |
|---|---------|
| 2-12x72 Norton Plain Grinders, latest type, each..... | \$1400. |
| 1-14x72 Norton Plain Grinder, latest type..... | 1500. |
| 1-10x36 Norton Plain Grinder, latest type..... | 1350. |
| 2-No. 2 Brown & Sharpe Universal Grinders, each..... | 800. |
| 1-6x32 Norton Plain Grinder, latest type..... | 800. |

MISCELLANEOUS

| | |
|--|---------|
| 1-No. 6 Fellows Gear Shaper, serial 5289, 36" capacity, like new..... | \$1800. |
| 1-3-A Cincinnati Spur Gear Cutter, 26" capacity, excellent condition..... | 750. |
| 1-Flather Spur Gear Cutter, 36" capacity, excellent condition..... | 750. |
| 1-30" Flather Spur Gear Cutter, excellent condition..... | 700. |
| 3-No. 75 Heald Internal Grinders, with all regular equipment, excellent condition, each..... | 600. |
| 1-No. 22 Heald Rotary Surface Grinder, shaper head, 12" magnetic chuck, excellent condition..... | 1150. |

PLANERS

| | |
|---|---------|
| 1-56"x56"x16' Gray Planer, 2 rail heads, 2 side heads, excellent condition..... | \$6000. |
| 1-30"x30"x 8' Gray Planer, 1 rail head, excellent condition..... | 1400. |
| 1-24"x24"x 6' Pratt & Whitney, 1 rail head..... | 500. |
| 1-18"x18"x 5' Pratt & Whitney, 1 rail head..... | 400. |

SHAPERS

| | |
|---|---------|
| 1-24" Gould & Eberhardt back geared crank Shaper, good condition..... | \$ 500. |
| 1-20" Gould & Eberhardt back geared crank Shaper, good condition..... | 400. |
| 1-16" Gould & Eberhardt back geared crank Shaper, good condition..... | 450. |
| 1-14" Smith & Mills crank Shaper, good condition..... | 400. |

The Empire Machinery Exchange Co., Inc.
517-519 The Newman-Stern Bldg., CLEVELAND, OHIO

New Machinery For Sale

In Stock at Chicago and New York

Lathes

24"x13' Chard, q. c. g., d. b. g.
20"x11' Chard, q. c. g., d. b. g., (3).
20"x10' Wickes, q. c. g., d. b. g.
16"x6' Whitcomb-Blaisdell.
14"x8' Cisco, q. c. g., d. b. g.

12"x8' 6" Davis tool room,
6"x30" and 6"x36" Dalton bench.
Full line, Rivett precision bench
Full line Stark precision bench.

Drilling Machines

3' Wisconsin sensitive radial.
32" Cleveland sliding head.
28" Cleveland sliding head.
25" Cleveland upright.
23" Cleveland upright.
23" Snyder upright.
22" Cleveland upright.

21" Cleveland upright, (3).
20" Wisconsin, all-gear, (2).
20" Canedy-Otto, upright, (4).
14" U. S.
Belt and motor driven bench.
Van Dorn portable electric.

Boring and Drilling Machines

No. 9 Pawling & Harnischfeger, (2). | No. 12 Pawling & Harnischfeger.

Milling Machines

No. 2-B Fox plain.
Nos. 1-A, 1-B and 0-B Fox plain.

Burke bench.
U. S. No. 1, hand.

Grinders

No. 3 Modern universal.
No. 1 Wilmarth & Morman univ.
Lafayette universal.
10"x32" Ott universal.
No. 103 Rivett internal.
No. 2 Reid surface.
6"x6" Ott internal.

Webster & Perks, No. 2 universal.
No. 1 Norton cutter and tool.
Grand Rapids drill—various sizes.
Partridge floor stands, (all sizes).
Strand electric, flexible shaft.
Dumore, (all sizes).

Shapers

24" Milwaukee.
20" Milwaukee heavy duty.

16" Milwaukee.
7" Rhodes horizontal.

Hack Saws

Peerless, (all sizes).
No. 1 Racine.

6"x6" Starrett.
6"x6" Economy.

Miscellaneous

Arbor presses, Atlas, all sizes.
Buffing machine, No. 2 Blount.
Filing machines, Nos. 2 & 3 Barry.

Press, Lebanon, foot.
Shear, 18-H Lenox, throatless.
Tinners' rolls, Pexto.

USED MISCELLANEOUS

Cold Saw, No. 15 Lea Simplex.
Lathe, 14"x5' Dreses Monitor. (2).

Lathe, 24" Steinle turret.

Dale Machinery Co., Inc.

Formerly

DALE-BREWSTER MACHINERY CO., INC.

541-7 W. Washington Blvd., - - - Chicago

54-60 Lafayette St., - - - New York

Address all inquiries attention Department A

NEW YORK'S GREATEST STOCK

ATTRACTIVE PRICES

DEPENDABLE MACHINES

SATISFIED CUSTOMERS

PARTIAL LIST

Punches and Shears

Farrel, 9" throat, punch 1" in 1" shear 8"x1" flat, 1 1/2" round.
Standard punch and shear, 40" throat, cut 1/2"x1/2", direct acting.
Peis beam shear, cap. 15" I-beams.
Lenox rotary shear, 32" throat, 1/2" cap., belt drive.
No. 5 Quickwork rotary shear, 48" throat, cap. 1/2" metal, motor drive.
No. 3 Quickwork rotary, 37" throat, cap. 3/16" metal, belt drive.
New Oeking hand shear, cap. 2".
No. 121 Toledo boilermaker's punching and riveting press, 60" horn.
12" Covington power gap shear, capacity 1/2", 18" gap.
48" Covington gap shear, 12" gap, 1" plate capacity.

Presses

No. 3-A Bliss toggle drawing, str. blank holder 8", stroke of plunger 12", will receive blank 20" dia., weight 16,200 lbs.
Two No. 666 Toledo knuckle joint, 2 1/2" str., 1,000 t. pressure, 80,000 lbs.
Three No. 604 Bliss rack-and-pinion reducing, ad. str. 4" to 42", weight 12,500 lbs.
No. 867 Toledo rack-and-pinion reducing, adjustable stroke 5" to 40".
Two No. 856 Toledo rack-and-pinion reducing, ad. str. 5" to 36".
No. 16 Bliss boring and wiring, 2 1/2" stroke, weight 1,250 lbs.
No. 3 Farrel, 1 1/2" str., wt. 1,700 lbs.
P-3 Ferracute, 1 1/2" str., wt. 3,100 lbs.
DG-5 Ferracute, geared, 3" stroke, weight 8,700 lbs.
Five V. & O. No. 104 dbl.-acting str. of slide 1", stroke of plunger 1 1/2".
No. 24 Mansfield dbl.-acting, str. of slide 1", stroke of plunger 1 1/2".
Behrendt dbl. acting o. b., grd., str. slide 1 1/2", stroke of plunger 3".
Two 7" Geo. A. Ohl power brakes, str. 2 1/2", cap. 1/2" metal, wt. 25,000 lbs.

Saws

6"x6" Racine, high speed.
6"x6" Marvel, h. s., auto. stock feed.
New No. 3 Ryerson friction, h. speed, capacity 2 1/2" I-beams or equivalent, motor drive.

Vertical Boring Mills

120" Niles, 2 swivel heads.
80" Niles Bement Pond, 2 swivel hds.
72" Niles, 2 swivel heads.
64" Poole, 2 swivel hds., thread-cutting attachment.
44" Niles, 1 swivel hd., 1 turret hd.
42" Putnam car wheel borer, hub-facing attachment and crane.
36" Niles car wheel borer, with crane.
32" Rogers swivel turret head, universal jaws in table.

Horizontal Boring Mills

Bement cylinder 8" bar, 12' between facing arms.
Barrett No. 2 cylinder, 5" bar.
Barrett boring and facing, 3 1/2" bar, having auxiliary head, set at right angles to main head.
Beaman & Smith No. 2 floor boring, drilling and milling 4" bar.
Lucas "Precision" boring, drilling and milling 3 1/2" bar, table 48"x30".
Niles boring and drilling, 4" bar.
Betts boring and drilling, 5" bar.
Newark boring & drilling, 4 1/2" bar.
Bement boring & drilling, 3 1/2" bar.
Newark boring & drilling, 3" bar.
Bement boring & drilling, 3" bar.
Bement boring & drilling, 2 1/2" bar.
Barnes drilling and tap., 2 3/16" bar.
Underwood type, 4 1/2" bar, fl. pl. 8"x9.

Planers

96"x96"x37" Hewes & Phillips, 4 heads and an auxiliary head.
14" Hillis & Jones plate planer, double tool holder.
72"x70"x14" Sellers, 3 heads, has widening blocks.
48"x48"x14" Patch heavy duty, 4 heads, motor drive, latest type.
42"x42"x14" Pond Mche. Co., 4 hds.
40"x36"x11" New Haven 1 head.
36"x36"x20" Woodward-Powell, 2hds.
36"x36"x12" Bickett, heavy duty, 2 heads, motor or belt drive.
36"x36"x12" Bickett, heavy duty, 1 head, motor or belt drive.
36"x36"x16" Detrick & Harvey open side, 1 rail head, 1 side head.
16"x16"x42" Walter Bros., 1 head.
55"x46"x14" Lincoln, 4 hds., for stone.
Two 28" Newton pl. index centers.

New York Machinery Exchange

Offices: 50 Church St., NEW YORK CITY

Machine Shop and Warehouses: 220-236 Culver Ave., JERSEY CITY, N. J.

ReMANUFACTURED - (ORIGINATED BY US) - MACHINE TOOLS

EVERY ReMANUFACTURED MACHINE TOOL in our place represents an unusual BARGAIN. A card will bring our latest GREEN LIST containing 2000 machine tools. We welcome inspection of our plant and our process.

LATHES.

- 8-8"x60" Fitchburg Lo-Swing.
- 1-Bridgeford hvy. duty d. end axle.
- 30-14"x 6" Reed ex. hvy. pl. turning.
- 6-16"x 6" Reed.
- 12-17"x 6" LeBlond mfg'r's. auto.
- 15-18"x 8" Boye & Emmes, belt id.
- 21-19"x 8" LeBlond, q. c. g., c. r.
- 27-19"x 8" LeBlond, hex. carr. tur.
- 31-19"x 8" LeBlond, p. f. turret.
- 91-20"x 8" American, c. r., q. c. g.
- 12-30"x 8" American, p. f. turret.
- 3-20"x 8" American, motor arr.
- 2-20"x12" American, c. r., q. c. g.
- 26-21"x10" LeBlond, c. r., q. c. g.
- 34-21"x10" LeBlond, carr. turret.
- 19-22"x 8" Davenport.
- 1-22"x 8" Lodge & S., motor arr.
- 13-26"x 9" Bridgeford, c. r., q. c. g.
- 70-26"x10" Bridgeford, c. r., q. c. g.
- 23-26"x12" Bridgeford, c. r., q. c. g.
- 2-26"x16" Bridgeford, c. r., q. c. g.
- 2-26"x20" Bridgeford, c. r., q. c. g.
- 32-26"x10" Niles-B.-P., c. r., q. c. g.
- 1-36"x12" Walcott, c. r., q. c. g.
- 1-26"x12" Putnam, c. r., semi q. c. g.
- 1-27"x20" Lodge & Davis engine.
- 6-30"x11" American, geared head.
- 2-30"x11" Houston, Stanwood & G.
- 19-32"x12" Pittsburgh, c. r., q. c. g.
- 2-36"x19" Johnson, triple geared.
- 15-36"x30" Pittsburgh grd. hd.
- 4-36"x37" Niles-B.-Pond grd. hd.
- 4-40"x12" Fifield, triple geared.
- 1-40"x18" Fifield, triple geared.

MILLERS.

- 53-No. 6 Whitney hand.
- 62-Garrigus hand.
- 22-Van Norman hand.
- 26-No. 4 Loew Victor Lincoln.
- 11-No. 12 Pratt & Whitney Lincoln.
- 50-No. 7 Becker Lincoln.
- 1-Type B-34" Briggs.
- 2-12" Pratt & Whitney semi-auto.
- 2-18" Cincinnati automatic.
- 1-17"x10" Beaman & Smith, 3 hds.
- 1-30"x12" Newton slab, 2 spdis.

- 1-48"x10" Newton slab.
- 3-No. 2 Pratt & Whitney hand.
- 1-No. 2 Chicago hand, p. f.
- 62-No. 3 1/2 Fox, p. f.
- 1-No. 1 Dow plain.
- 1-No. 4-B Becker vertical.
- 2-No. 4 Cincinnati plain, s. p. d.
- 11-No. 4 Hendey Lincoln.
- 7-Putnam semi-automatic.

BORING MILLS.

- 1-73" Colburn vertical.
- 1-10" Niles vertical.
- 1-4" bar Niles horizontal.
- 1-Beaman & Smith horiz., 2 heads.
- 1-2 spindle Espen-Lucas, 2 heads.

SHAPERS AND PLANERS.

- 2-26" Kelley, back geared.
- 2-36"x13"x14" N.-B.-P., frog & sw.
- 1-56"x56"x10" Gray, 2 heads.
- 1-72"x72"x14" Niles planers, 4 hds.
- 1-96"x72"x20" Bement-M., 4 hds.

TURRET AND SCREW MCHS.

- 8-1/2" Pratt & Whitney screw.
- 1-1" Pratt & Whitney screw.
- 3-2" Pratt & Whitney screw.
- 8-No. 2 Pratt & Whitney screw.
- 14-No. 2 Warner & Swasey screw.
- 5-No. 2 Foster screw.
- 5-No. 3 Foster screw.
- 3-No. 4 Warner & Swasey.
- 17-No. 4 Wood turret screw.
- 2-3-A Warner & Swasey.
- 2-20" P. & W. grd. hd., chucking.
- 39-24" Steidle turret.
- 1-No. 6 Brown & Sharpe screw.
- 4-No. 75 1/4-sp. N.-Acme auto screw.
- 1-No. 4-1 1/2" Southworth screw.
- 2-3"x36" Jones & L. grd. feed.
- 1-3"x36" Acme turret.

GRINDERS.

- 12-American drill.
- 1-No. 2 Garvin hole.
- 2-No. 70 Heald internal.
- 1-12"x96" Landis plain.
- 1-No. 2 Bath surface.
- 1-8"x48" Thompson surface.
- 2-12"x36" Landis plain.

Write for our Green List describing these and many others

HILL, CLARKE & CO. OF CHICAGO
649 W. WASHINGTON BLVD., CHICAGO, ILL.

IN STOCK For Immediate Delivery

BORING MILLS

No. 9 Giddings & Lewis horizontal.
60" Bullard, 2 plain heads.

DRILLING MACHINES

16" Cleveland, h. s. b. b. Drill.
6' Gang Radial Drill.
6' Prentice Radial Drill.

GEAR CUTTERS

No. 3 Farwell Gear Hobber.
8" Hercules.

GRINDERS

| | |
|----------------------------------|----------------------------|
| No. 12 Brown & Sharpe universal. | No. 8 Besly Disc Grinder. |
| 8"x40" Morse Grinder. | No. 10 Besly Disc Grinder. |
| 14"x50" Norton Grinder. | Gisholt Tool Grinder. |
| No. 12 Modern Grinder. | |

LATHES

16"x 6' Bradford, compound rest.
16"x 8' Hamilton style "A", taper and relieving attachment.
18"x10' Bradford, compound rest, double back gear.
32"x18' Bradford, compound rest.
PORTER CABLE Mfg. Lathe.

MILLING MACHINES

| | |
|-----------------------------|------------------------|
| No. 5 Hendey, Lincoln type. | No. 3 Becker vertical. |
| Taylor & Fenn vertical. | No. 13 Brown & Sharpe. |
| No. 18 Cincinnati plain. | 12" P. & W. automatic. |
| No. 14 Rockford plain. | Type "A" Briggs. |
| No. 3-B Milwaukee plain. | No. 32 Kempsmith. |
| No. 5-B Brown & Sharpe. | |

SCREW MACHINES

No. 9 Foster, plain head, automatic chuck and wire feed.
No. 2 Foster, plain head, automatic chuck and wire feed.
No. 1 Pratt & Whitney, automatic chuck and wire feed.

TURRET LATHES

21" Gisholt.
24" Gisholt.
2"x24" Jones & Lamson.
Potter & Johnston.
24" Cleveland, automatic.
14" Warner & Swasey.

PRESSES

No. 6 Eames Arbor Press.
No. 2-A Bliss Double Crank Geared Press.

Stocker-Rumely-Wachs Company

117-121 N. Jefferson Street

CHICAGO, ILL.

60 Norton Grinders

Do you need Cylindrical Grinders? Here is your opportunity to get good modern machines at an unusually low price.

Ten— 6"x32"
Six—10"x24"
Four—10"x28"
Two—10"x36"
Two—10"x72"
Eight—14"x36"
Eighteen—14"x50"
Five—14"x72"
Four—16"x32" Landis
One—16"x36" Queen City

Cam Grinders

Seven—10"x28" Norton

Write for further particulars. Send us your inquiries for other machine tools, as we have an unusually large stock of modern machines we are offering at attractive prices.

Peninsular Machinery Co.

429 E. Jefferson Ave., Detroit, Mich.

Machine Tools at Right Prices

David A. Wright

568 W. Washington Blvd., CHICAGO Phone: Franklin 5899

**New, Used and GUARANTEED Rebuilt
Machinery for Immediate Delivery**

SCREW MACHINES

No. 4 W. & S., p. l. to turret.
No. 0 Brown & Sharpe automatic.
No. 2 B. & S. automatic, $\frac{1}{2}$ " cap.
No. 1 Chicago automatics, $\frac{1}{2}$ " cap.
No. 1 Bardons & Oliver, 1" cap.
No. 3 Stecher, 1 5-16" cap.
No. 1 1/2 P. & W., $\frac{1}{2}$ " cap.
1 1/2" Cleveland auto., model B.
1 1/2" Cleveland auto., model B.
1 1/2" Cleveland auto., model A.
No. 52 National Acme 4 spindle.
No. 515 National Acme 4 spindle.

GRINDERS

6"x20" Fitchburg plain auto.
12x20" Fitchburg plain auto.
12x26" Fitchburg plain auto.
No. 14 Gardner disc, univ. tables.
No. 14 Besly disc, univ. tables.
No. 1 W. & W. Surface.
No. 1 W. & W. tool and cutter.
1 Hartford surface.

MILLERS

No. 0 Steptoe b. g. plain.
20x7x17 Oesterlein b. g. plain.
No. 25 Hilton b. g. plain.
No. 34 Fox hand, p. f., b. g.
No. 14 American b. g., p. f., plain.
3" & 6" Lees Bradner thread.
3" Foster thread.
No. 12 P. & W., Lincoln tpe.

DRILLING MACHINES

21" Superior, tapp. attach.
24" Milwaukee, s. h., p. f.
24" Colburn D-4, h. d.
20" Bickford, b. g., p. f.
42" Wright, s. h., b. g.
54" Davis, b. g., p. f.
2 spindle Edlund, b. b., h. s.
6 spindle Allen, b. b., h. s.
12 spindle P. & W. mult., $\frac{1}{2}$ " cap.
16 spindle P. & W. mult., $\frac{1}{2}$ " cap.

SHAPERS

14", 16" & 20" Steptoe.
20" Walcott.
24" Lodge & Davis.
24" Queen City.

PUNCH PRESSES

No. 3 Norton incl.
No. 3 R. & K., incl.
No. 17 Bliss, o. b. i.
No. 18 Bliss, o. b. i.
No. 4 McDonald incl.
No. 54 Walsh o. b. i. 4" str. grd.
No. 65-N Bliss, double acting.
No. 68-C 2 Bliss, double acting.
No. 68-W Bliss, double acting.
No. 20 Bliss.
Nos. 58-59-59 1/2 Toledo, s. s.

LATHES

No. 2 Niles axle, 8' cent.
No. 3 Niles axle.
34x60, 6x60, 8x60 & 8x108 Lo-Swing.
14x6 Filamith, q. c. g.
14x6 Reed-Prentice, h.d. oil pan bed.
16x7 Oliver tool room, q. c. g.
16x8 Gisholt turret.
17x6 LeBlond, q. c. g.
18x8 Oliver, t. r., q. c. g.
20x8 Hamilton, s. q. c. g.
24x12 Cisco, q. c. g.
24x12 Gisholt turret.
24"20 American, q. c. g.
23x24 Putnam standard.
28x10 Pond, q. c. g.
30x12 Putnam, geared head.
30x13 6" Oliver, geared head.
32x28 Bridgeford, geared head.
26x16 Standard, raised to 60".
36x22 Bridgeford, geared head.
52" Niles car wheel.
50x20 Fifield, triple geared.
96x24 Fifield, triple geared.

MISCELLANEOUS

30" Rogers Boring Mill.
20th Century Die Filing Machine.
No. 404 Oliver Die Filing Machine.
6x6 Curtis Compressor.
50 h. p. Atlas Steam Engine.
100 h. p. Watertown Auto. Steam Eng.
50 h. p. Chalmers Lighting Gener.
Largest stock of machine tools.
This is only a partial list.

SEND US YOUR INQUIRIES. WE HAVE WHAT YOU NEED.

OUR GUARANTY MONEY BACK IF NOT SATISFIED

Drills—Radial

- | | |
|---|---------------------------------------|
| 1—No. 4 Foote-Burt 6-sp. rail drill, No. 5 Morse taper, 99% new. | 1—4' Lodge & Davis Plain. |
| 1—5' Universal Radial. | 6—20" Weigel w. & l. feed Drills. |
| 1—4' Universal Radial. | 4—Hoefler Drills, 21", 24", 26", 28". |

Grinders

- | | |
|-----------------------------------|--------------------------------|
| 2—10x36" Thompson Full Univ. | 1—No. JA Yankee Drill Grinder. |
| 1—No. 2 Manhattan Surface. | 1—Used No. 2 Woods Cutter. |
| 1—Grand Rapids Drill, 2 1/2" cap. | 1—Gisholt Tool Grinder. |
| 3—No. 2 Oakley Univ. C. & T. | |

Shapers

- | | |
|----------------------------|--|
| 2—16" Streine B. G. (new). | 1—20" Ohio B. G. Crank (new). |
| 4—16" Whipp S. G. Crank. | 1—Each 16, 18, 21, 24" Hollingsworth B. G. Crank (new). |
| 1—20" Whipp B. G. Crank. | |

Millers

- | | |
|---|-----------------------------------|
| 5—Rockford, all univ., Nos. 1 1/2-2-2 1/2, 3-st. cone, d. b. g., sgl. pulley dr. | 10—No. 32 Kempsmith Lincoln Type. |
| 1—No. 2 American Plain (used). | 2—No. 1 1/2 American Plain. |
| 2—No. 1 U. S. Hand Millers. | 1—No. 1 1/2 American Universal. |

Presses and Punches

- | | |
|--|--|
| 1—No. 2 Pratt & Whitney Forming and Trimming Press. | 1—Doty Combined Punch & Shear, grd.; cap about 4x4", with 7" iht. |
| 6—Willard Presses, 2, 3, 4, 5-A Inc. | |

Gisholt Turret Lathes

- 19—24", with 2 1/2", 4 1/2" and 6 1/2" h. s., chucking equip., qck. ret., rapid traverse.

Hand Screw Machines

- 14—No. 2 Smith, rd. collet, 1-1/16"; wire fd., auto. chuck, ind. stops to turret.
1—Foster Screw Machine, 1 3/16" capacity.

Baush Multiple Spindle Drills

- 1—Baush Multiple, arranged for 24 spindles; now with 12 spindles; takes 60"
bet. columns; drills in any circle 12-48" dia.; approximate weight 30,000 lbs.
1—No. 1 Baush High Speed Multiple Spindle, rectangular head 16x20"; ar-
ranged for 16 spindles; now with 10 1/2" spindles; No. 2 M. T.; cone drive.
1—Baush Multiple, arranged and equipped with 16 spindles, No. 1 M. T.

Lathes

- 4—Ideal Precision Lathes, 7" swing, comp. slide, grinding attachment.
3—Ames Precision Lathes, 8" swing, compound slide.
2—12 & 14" x 6' Worcester Tool Room, taper attachment, pan and collet.
1—Used Blaisdell 22"x10' b. g. Engine Lathe.
1—Each Sidney Heavy Duty Lathes, 15, 17, 19, 25 and 27" by 6, 8, 10, 12 and
14' beds, d. b. g., 3-step cone, q. c. g.
1—Each Sidney Medium Pattern Lathes, 14, 16, 18 and 20" by 6, 8 and 10' beds,
d. b. g., 3-step cone, q. c. g.
1—20"x10' Bradford, with turret attachment on carriage, compound rest,
h. s. and ind. change gears.
1—25"x8' Economy Heavy Duty Single Purpose Lathe, d. b. g., 3-step cone,
c. r., hollow spindle, quick change feed.
1—12"x6' Reed.
2—14"x6' Monarch, h. s., c. r.
1—16"x8' Monarch h. s., c. r.
1—17"x8' Putnam.

Planers

- | | |
|------------------------------|----------------------------------|
| 1—24"x24"x 5' Gray, 1 head. | 1—32"x32"x10' Fitchburg. |
| 1—26"x24"x 6' Pond, 2 heads. | 1—40"x40"x10' New Haven, 1 head. |

Stock changing daily—Write us your requirements

WAYNE MACHINERY CO. FT. WAYNE, IND.

Branches: — 18 W. Second St., Dayton, Ohio
121 So. Third St., Louisville, Ky.

Used Machinery

For Sale By

Vonnegut Machinery Co.

Indianapolis, Indiana

1—36"x22' Lodge & Shipley Engine
Lathe, Geared Head, S. P. D., 14'
6" between centers.

1—36"x18' LeBlond High Duty Engine
Lathe, adaptable direct motor
drive only.

1—42x42x22' Flather Planer, 3 heads.

1—48x48x22' Cincinnati Planer, four
heads (practically new).

1—30 ton Case Crane, 5 ton auxiliary
lift, 75' span, four motors (practi-
cally new).

1—10' Bertsch Squaring Shear.

1—No. 55 Toledo Punch Press.

2—No. 74 Toledo Punch Presses.

Classified Finding Index

Air Guns

Powell Co., Wm., Cincinnati

Angle Plates

Fairbanks Company, The, New York
Reid Brothers, Co., Inc., Beverly, Mass.

Arbors, Roller Grip

Alert Tool Co., Philadelphia

Arbors, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.
E. O. Partridge 2047 W. Lake St., Chicago

Automatics

National Acme Company, Cleveland
New Britain Machine Co., New Britain, Conn.

Balancing Ways

Anderson Bros. Mfg. Co., Rockford, Ill.

Ball Bearings

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., The, 22 Flatbush Ave., Brooklyn, New York

Balls, Brass, Bronze and Steel

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., The, 22 Flatbush Ave., Brooklyn, New York

Band Saw Machines, for Metal

Armstrong-Bloom Mfg. Co., 341 N. Francisco Ave., Chicago

Barrels, Tumbling

Abbott Ball Co., Hartford, Conn.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Belt Shifter

Kremer-Cummins Machine Co., Cleveland

Bench Legs, Steel

New Britain Mch. Co., New Britain, Conn.

Bending Machines, Hand and Power

Armstrong-Bloom Mfg. Co., 341 N. Francisco Ave., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H. 417 E. 31st., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Boring Bars

Alert Tool Co., Philadelphia
Madison Mfg. Co., Muskegon, Mich.
Pedrick Tool & Machine Co., Philadelphia
Ready Tool Co., Bridgeport, Conn.
Underwood Corp., H. B., Philadelphia

Boring Bars, Cylinder

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Boring, Drilling and Milling Machines, Horizontal

Barnes Co., W. F. & John, Rockford, Ill.
Heaman & Smith Co., Providence, R. I.
Carroll Fdry. & Mch. Tool Co., Bucyrus, Ohio
Lawling & Harnischfeger Co., Milwaukee
Simmons Machine Co., Albany, N. Y.

Boring Machines, Horizontal

Avey Drilling Machine Co., Cincinnati
Pedrick Tool & Machine Co., Philadelphia

Boring and Turning Machines, Vertical

Simmons Machine Co., Albany, N. Y.
Turner Machine Co., Danbury, Conn.

Bowden Wire Mechanism

Gwilliam Co., The, 22 Flatbush Ave., Brooklyn, New York

Broaches

Veeco Mfg. Co., Inc., Greenfield, Mass.

Broaching Machines

Simmons Machine Co., Albany, N. Y.

Bushings, Brass and Bronze

Bunting Brass & Bronze Co., Toledo, Ohio

Case Hardening Compound

Buchanan Chemical Co., C. G., Cincinnati

Casters for Trucks

Hamilton Caster & Mfg. Co., Hamilton, Ohio

Centers, Index

Brown & Sharpe Mfg. Co., Providence, R. I.
Carter & Hakes Mch. Co., W. Winsted, Conn.

Chains, Power Transmission

Cullman Wheel Co., 1344 Altgeld St., Chicago
Whitney Mfg. Co., Hartford, Conn.

Chasers

Modern Tool Co., Erie, Pa.
National Acme Co., Cleveland

Chucking Machines

New Britain Mch. Co., New Britain, Conn.

Chucks, Air

Frontier Chuck & Tool Co., Buffalo, N. Y.

Chucks, Centering

McCroskey Tool Corporation, Meadville, Pa.
Thomas Elevator Co., 31 So. Hoynes Av., Chicago

Chucks, Draw-in and Thrust

Hardinge Bros., 1770 Bertensu Av., Chicago

Chucks, Drill

Collis Company, The, Clinton, Iowa
Hartford Special Mch. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Thomas Elevator Co., 31 S. Hoynes Av., Chicago
Weaver Mfg. Co., Springfield, Ill.

Chucks, Drill and Tap

Collis Company, The, Clinton, Iowa
McCroskey Tool Corporation, Meadville, Pa.
Peter Bros. Mfg. Co., Algonquin, Ill.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Keyway Cutting

Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Lathe

Thomas Elevator Co., 31 S. Hoynes Av., Chicago

Classified Finding Index

Chucks, Magnetic

Heald Machine Co., Worcester, Mass.

Chucks, Wrenchless

Thomas Elevator Co., 31 S. Hoyne Ave.
Chicago

Clutches, Friction

Edgemont Machine Co., Dayton, Ohio
Milwaukee Shaper Co., Milwaukee, Wis.

Cold Saws

Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Fairbanks Company, The, New York
Knowlton Machine Co., Westbrook, Me.
Peter Bros. Mfg. Co., Algonquin, Ill.

Collets, Lathe and Screw Machine

Hardinge Bros., 1770 Berteau Av., Chicago
Morrison Machine Products, Inc.,
Rochester, N. Y.

Couplings, Flexible

Cooper Flexible Transmission Co., Inc.,
Brooklyn

Cranes, Hand Power

Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable

Candey-Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mch. Co., Canton, Ohio
Weaver Mfg. Co., Springfield, Ill.

Cranes, Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger Co., Milwaukee, Wis.

Crank Pin Turning Machine

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cutters, Adjustable

Fairbanks Company, The, New York
McCroskey Tool Corporation, Meadville, Pa.
Madison Mfg. Co., Muskegon, Mich.

Cutters, Bolt

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Cutters, Keyseating

Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Whitney Mfg. Co., Hartford, Conn.

Cutters, Milling

Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., Meriden, Conn.
Meback Tool & Machine Co., Boston
Whitney Mfg. Co., Hartford, Conn.

Cutting-Off Machines

Davis Machine Tool Co., Rochester, N. Y.
Etma Mfg. Co., Toledo, Ohio
Peter Bros. Mfg. Co., Algonquin, Ill.

Cylinder Boring Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cylinder or Dome Facing Machines

Underwood Corp., H. B., Philadelphia

Die Heads, Self-Opening

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland

Dicing Machines

Henry & Wright Mfg. Co., Hartford, Conn.

Dies, Pipe Threading

Signal & Kooler Mch. Wks., Edwardsville, Ill.

Dies, Screw and Thread Cutting

Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berteau Av., Chicago
National Acme Company, Cleveland

Dies, Self-Opening Adjustable

Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Murchey Mch. & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.
Victor Tool Co., Inc., Waynesboro, Pa.

Dogs, Machine

Ready Tool Co., Bridgeport, Conn.

Drilling Heads for Square Holes

Fairbanks Company, The, New York

Drilling Machine Heads

Nelson-Blanch Mfg. Co., Detroit, Mich.
Sellew Machine Tool Co., Pawtucket, R. I.
United States Drill Head Co., Cincinnati
United States Machine Tool Co., Cincinnati

Drilling Machines, Bench

Avey Drilling Machine Co., Cincinnati
Barnes Co., W. F. & John, Rockford, Ill.
Burke Machine Tool Co., Conneaut, Ohio
Candey-Otto Mfg. Co., Chicago Heights, Ill.
High Speed Hammer Co., Rochester, N. Y.
Reed Co., Francis, Worcester, Mass.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Horizontal

Pawling & Harnischfeger Co., Milwaukee, Wis.

Drilling Machines, Multiple Spindle

Avey Drilling Machine Co., Cincinnati
Detroit Machine Tool Co., Detroit, Mich.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Company, Cleveland
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Post

Candey-Otto Mfg. Co., Chicago Heights, Ill.
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati

Drilling Machines, Radial

Candey-Otto Mfg. Co., Chicago Heights, Ill.
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Pawling & Harnischfeger Co., Milwaukee, Wis.
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.

Drilling Machines, Sensitive

Avey Drilling Machine Co., Cincinnati
Burke Machine Tool Co., Conneaut, Ohio
Candey-Otto Mfg. Co., Chicago Heights, Ill.
Hardinge Brothers, 1770 Berteau Av., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
United States Machine Tool Co., Cincinnati
Wisconsin Electric Co., Racine, Wis.

Classified Finding Index

Drilling, Milling and Boring Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Drilling Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Avey Drilling Machine Co., Cincinnati
Barnes Co., W. F. & John, Rockford, Ill.
Candry-Otto Mfg. Co., Chicago Heights, Ill.
Davis Machine Tool Co., Rochester, N. Y.
The Fairbanks Company, New York
Frontier Mch. Tool Co., Inc., Buffalo, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Minster Machine Co., Minster, Ohio
Nipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling and Tapping Attachments
Aurora Tool Works, Aurora, Ind.
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Reed Co., Francis, Worcester, Mass.
Nipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Portable Pneumatic
Keller Pneumatic Tool Co., Grand Haven, Mich.

Drills, Portable Electric
Wisconsin Electric Co., Racine, Wis.

Dust Handling Equipment
Knickerbocker Co., Jackson, Mich.

Emery Stands
Blount Co., J. G., Everett, Mass.
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters
Precision Truing Mch. & Tool Co., Cinth.
Taylor & Fenn Co., Hartford, Conn.

Facing Heads, Automatic
Mummert-Dixon Co., Hanover, Pa.

Feeders, Oil and Soda Water
New Britain Machine Co., New Britain, Conn.

Filing Machines
Cochrane-Ely Co., Rochester, N. Y.
Johnson & Biddle Tool Co., Elkhart, Ind.

Filing and Sawing Machines
Johnson & Biddle Tool Co., Elkhart, Ind.

Flexible Shafts
Strand & Co., N. A., 549 Washington Blvd., Chicago

Forges
Candry-Otto Mfg. Co., Chicago Heights, Ill.

Forgings, Drop
Western Tool & Mfg. Co., Springfield, Ohio

Forgings, Hollow Bored
American Hollow Boring Co., Erie, Pa.

Furnaces
Bennett Co., W. R., Elmwood, Conn.
Strong, Carlisle & Hammond Co., Cleveland

Furniture, Machine Shop
New Britain Machine Co., New Britain, Conn.
Western Tool & Mfg. Co., Springfield, Ohio

Gauges, Amplifying, Snap and Plug
Alingo Tool, Die and Machine Works, Geo. H., Springfield, Ohio

Gauges, Taper
Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gear Cutting Machines
Brown & Sharpe Mfg. Co., Providence, R. I.

Gears
Merkle-Korff Gear Co., 813 S. Clinton St., Chicago
Stranahan Gear Co., Inc., Philadelphia

Grinding Machines, Bench
Blount Co., J. G., Everett, Mass.
Partridge, E. O., 2047 W. Lake St., Chicago

Grinding Machines, Cutter, Reamer and Tool
Barnes Co., W. F. & John, Rockford, Ill.
Blount Co., J. G., Everett, Mass.
Clough, R. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
Manhattan Machine & Tool Works., Grand Rapids, Mich.

Modern Tool Co., Erie, Pa.
Mummert-Dixon Co., Hanover, Pa.
National Acme Co., Cleveland
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Cylinder
Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Grinding Machines, Cylindrical
Brown & Sharpe Mfg. Co., Providence, R. I.
Detroit Machine Tool Co., Detroit, Mich.
Greenfield Machine Co., Greenfield, Mass.
Manhattan Machine & Tool Works., Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Schmidt Co., R. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Die
Manhattan Machine & Tool Works., Grand Rapids, Mich.
Modern Tool Co., Erie, Pa.
Reed Bros. Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Disc
Silliew Machine Tool Co., Pawtucket, R. I.

Grinding Machines, Drill
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Face
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Internal
Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Oilstone
Mummert-Dixon Co., Hanover, Pa.

Grinding Machines, Portable
Mummert-Dixon Co., Hanover, Pa.
Strand & Co., N. A., 549 Washington Blvd., Chicago
Wisconsin Electric Co., Racine, Wis.

Classified Finding Index

Grinding Machines, Snagging
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Manhattan Machine & Tool Works, Grand Rapids, Mich.

Grinding Machines, Surface
Heald Machine Co., Worcester, Mass.
Reid Brothers Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Tap
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.

Grinding Machines, Universal
Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Wheel Dressers
Miller & Sons, Otto A., Detroit, Mich.

Hack Saw Machines
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Western Tool & Mfg. Co., Springfield, Ohio

Hammers, Belt & Motor Driven
Beaudry & Co., Boston
United Hammer Co., Boston

Hammers, Power
Nazel Engineering & Mch. Wks., Philadelphia

Hammers, Riveting
High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio

Heads, Dividing
Simmons Machine Co., Albany, N. Y.
Willard-Middletown Machine Co., Cincinnati

Heads, Index
Dickow, Fred C., 2504 W. Lake St., Chgo.

Hoists, Air
Northern Engineering Works, Detroit, Mich.

Hoists, Electric
Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Thomas Elevator Co., 31 S. Hoyne Ave., Chicago
Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling
Euclid Crane & Hoist Co., Euclid, Ohio
Northern Engineering Works, Detroit, Mich.
Pawling & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable
Canton Foundry & Machine Co., Canton, Ohio

Holders and Counterbores
Manufacturers Machine Products Co., Detroit, Mich.

Jigs, Fixtures, Tools, Etc.
Ainge Tool, Die and Machine Works, Geo. H., Springfield, Ohio
Hartford Special Mch. Co., Hartford, Conn.
Hincley Machine Works, Hincley, Ill.
Potter Tool & Machine Works, S. A., 79 E. 130th St., New York
Way Co., A. F., Hartford, Conn.

Joints, Universal
Atmelle Mch. & Tool Works, Hartford, Conn.
Burgess Manufacturing Co., Inc., Torrington, Conn.
Cooper Flexible Transmission Co., Inc., Brooklyn

Keyseating Machines
Bucher-Smith Co., East Liverpool, Ohio
Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
National Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Lathe Accessories and Attachments
Hardinge Bros., 1770 Berteau Ave., Chicago
McCronky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.

Lathes, Automatic
National Acme Company, Cleveland

Lathes, Bench
Blount Co., J. G., Everett, Mass.
Hardinge Brothers, 1770 Berteau Av., Chicago
Potter Tool & Machine Works, S. A., 79 E. 130th St., New York

Lathes, Engine
Barnes Co., W. F. & John, Rockford, Ill.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Davis Machine Tool Co., Rochester, N. Y.
Hardinge Bros., 1770 Berteau Ave., Chicago
Lehmann Machine Co., St. Louis, Mo.
Monarch Machine Tool Co., Sidney, Ohio
Musler Machine Tool Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
Standard Lathe Works, Cincinnati
Willard Machine Tool Co., Cincinnati

Lathes, Foot Power
Barnes Co., W. F. & John, Rockford, Ill.

Lathes, Horizontal Turret
Davis Machine Tool Co., Rochester, N. Y.
Steinle Turret Machine Co., Madison, Wis.

Lathes, Short Cut
Sidney Tool Co., Sidney, Ohio

Lathes, Speed and Hand
Blount Co., J. G., Everett, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.

Lockers, Shelving and Cupboards, Steel
Terrell's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding
Alert Tool Co., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, Ohio

Mandrels, Solid
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Measuring Devices
Van Keuren Co., The, Boston

Metal Cutting Machines, Sheet
Quickwork Co., St. Marys, Ohio
Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Microgages
Van Keuren Co., The, Boston

Milling Attachments
Ainge Tool, Die and Machine Works, Geo. H., Springfield, Ohio
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Connetquot, Ohio
Hincley Machine Works, Hincley, Ill.
Knight Machinery Co., W. B., St. Louis, Mo.
Potter Tool & Machine Works, S. A., 79 E. 130th St., New York
Willard-Middletown Machine Co., Cincinnati

Classified Finding Index

Milling Machines, Bench

Burke Machine Tool Co., Connaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Brothers, 1770 Berneau Ave., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Burke Machine Tool Co., Connaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Bros., 1770 Berneau Ave., Chicago
United States Machine Tool Co., Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Beaman & Smith Co., Providence, R. I.

Milling Machines, Plain

American Milling Machine Co., Cincinnati
Beaman & Smith Co., Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Connaut, Ohio
Cochrane-Bly Co., Rochester, N. Y.
Hardinge Bros., 1770 Berneau Ave., Chicago

Milling Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

American Milling Machine Co., Cincinnati
Brown & Sharpe Mfg. Co., Providence, R. I.
Cochrane-Bly Co., Rochester, N. Y.

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Connaut, Ohio
Clough, R. M., Meriden, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Hardinge Bros., 1770 Berneau Ave., Chicago
Knight Machinery Co., W. B., St. Louis, Mo.
Taylor & Fenn Co., Hartford, Conn.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Nut Facing Machines

Victor Tool Co., Inc., Waynesboro, Pa.

Oil Cups

Gits Bros. Mfg. Co., 1940 S. Kilbourn Ave., Chicago
Tucker, W. C. & F. C., Hartford, Conn.

Oil Extractors

Curtis, Albert B., Estate, Worcester, Mass.

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Pattern Shop Machinery

Cochrane-Bly Co., Rochester, N. Y.
Towsley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Rignall & Keeler Mch. Wks., Edwardsville, Ill.
Simmons Machine Co., Albany, N. Y.

Piston and Piston Ring Machines

National Acme Company, Cleveland.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Attachment, Slotting

Moore Co., H. A., Rochester, N. Y.

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Planing Machines, Metal

Fairbanks Co., The, New York

Pneumatic Tools

Keller Pneumatic Tool Co., Grand Haven, Mich.

Polishing and Buffing Machines

Bount Co., J. G., Everett, Mass.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
New Britain Machine Co., New Britain, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago
Wilmarth & Morman Co., Grand Rapids, Wis.
Wisconsin Electric Co., Racine, Wis. (Mich.)

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Lourie Mfg. Co., Springfield, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Weaver Mfg. Co., Springfield, Ill.

Presses, Broaching

Atlas Press Co., Kalamazoo, Mich.
Bartlett, Edwin E., Nashua, N. H.
Lourie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Rockford Iron Works, Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.
Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Hendley & Whittmore Co., Beloit, Wis.
Loshbough-Jordan T. & M. Co., Elkhart, Ind.
Rockford Iron Works, Rockford, Ill.
Willard-Middletown Machine Co., Cincinnati

Presses, Punch

Enterprise Machinery Co., 32 S. Clinton St., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 417 E. 31st St., N. Y.
Loshbough-Jordan T. & M. Co., Elkhart, Ind.
Lourie Mfg. Co., Springfield, Ill.
Partridge, E. O., 2047 W. Lake St., Chicago
Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
Lourie Mfg. Co., Springfield, Ill.
Manhattan Machine & Tool Works, Grand Rapids, Mich.
Towsley Mfg. Co., John T., Cincinnati
Weaver Mfg. Co., Springfield, Ill.

Pulley Machinery

Avey Drilling Machine Co., Cincinnati

Pulleys, Iron, Solid and Split

Enterprise Machinery Co., 32 S. Clinton St., Chicago

Pumps, Lubricating

Michigan Machine Co., Detroit, Mich.

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punch, Shear and Bender, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago
Hendley & Whittmore Co., Beloit, Wis.
Lewthwaite Mch. Co., T. H., 417 E. 31st St., New York
Whitney Metal Tool Co., Rockford, Ill.

Classified Finding Index

Punches, Power

Clough, R. M., Meriden, Conn.
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Punches and Dies

Ainge Tool, Die and Machine Works, Geo. H.,
Springfield, Ohio
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 417 E. 31st St.,
Rockford Iron Works, Rockford, Ill. (N. Y.)

Racks, Bar Stock

New Britain Machine Co., New Britain, Conn.

Reamer Holder, Floating

Victor Tool Co., Inc., Waynesboro, Pa.

Reamers, Adjustable

Clough, R. M., Meriden, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
McCroskey Tool Corporation, Meadville, Pa.

Reamers, Cylinder

Hinckley Machine Works, Hinckley, Ill.
McCroskey Tool Corporation, Meadville, Pa.

Reamers, Solid

Clough, R. M., Meriden, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Ready Tool Co., Bridgeport, Conn.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Riveting Machines

Grant Mfg. & Mch. Co., Bridgeport, Conn.
High Speed Hammer Co., Rochester, N. Y.

Red Cutters

Armstrong-Blum Mfg. Co., 341 N. Francisco
Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lewthwaite Mch. Co., T. H., 417 E. 31st St., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Roller Bearings

Gwilliam Co., The, 23 Flatbush Ave., Brooklyn,
New York

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co., Rockford, Ill.

Screw Driving Machines, Automatic

Reynolds Machine Co., Massillon, Ohio

Screw Machines, Automatic

Brown & Sharpe Mfg. Co., Providence, R. I.
National Acme Company, Cleveland
New Britain Mch. Co., New Britain, Conn.

Screw Machines, Auxiliary

National Acme Company, Cleveland

Screw Machines, Plain or Hand

Potter Tool & Machine Works, S. A.,
79 E. 130th St., New York

Screws, Cap and Set

National Acme Company, Cleveland

Second-Hand Machinery Dealers

Bath & Co., Cyril J., Cleveland
Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.

Second-Hand Mch. Dealers—Cont'd

Dale Machinery Co., Inc., 541 Washington
Bldg., Chicago
Enterprise Machinery Co., 32 S. Clinton St.,
Chicago

Empire Machinery Exchange, Cleveland
Kosley Machinery Co., E. L., 656 Washington
Bldg., Chicago

Federal Mch. Sales Co., 12 N. Jefferson St.,
Chicago

Graves Mch. Exch., 50 Church St., New York
Harris Bros. Co., W. 35th & Iron, Chicago

Hill, Clarke & Co., 625 Wash'n Bldg., Chicago
Johnson & Sons Machinery Co., Wm. C.,
St. Louis, Mo.

Jones Machine Tool Co., Cincinnati
Kemp Machinery Co., Baltimore, Md.

Little Co., W. P., Cleveland
Lucas & Son, Inc., J. L., Bridgeport, Conn.

Lynd-Farguhar Co., Boston, Mass.
McCabe Lathe & Machinery Corp., J. J.,
149 Broadway, New York

McDonald Machinery Co., St. Louis
McMullen Mch. Co., Grand Rapids, Mich.

Marshall & Hunsburt Machinery Co., 17 S.
Jefferson St., Chicago

Metz & Merryweather Mch. Co., Cleveland
New York Machinery Exchange, 59 Church
St., New York

Niles-Bement-Pond Co., 111 Broadway, N. Y.
Norton-Broadway Mch. Co., Cincinnati

O'Brien Machinery Co., Philadelphia
Osborne & Sexton Machy. Co., Columbus, O.

Oviatt & Co., D. C., Cleveland
Peninsular Machinery Co., Detroit, Mich.

Prentiss & Co., Henry, Singer Bldg., N. Y.
Reliance Machinery Sales Co., Pittsburgh

Russell Machine Co., Pittsburgh, Pa.
Simmons Machine Co., Albany, N. Y.

Stocker-Rumely-Wacha Co., 117 N. Jefferson
St., Chicago

Strong, Carlisle & Hammond Co., Cleveland
Syracuse Supply Co., Syracuse, N. Y.

Tomney, Inc., Frank, Philadelphia
Vonnegut Machinery Co., Indianapolis, Ind.

Walsh Machinery Co., M. J., Milwaukee, Wis.
Wayne Machy. Co., Fort Wayne, Ind.

Winterer, Herman L., Philadelphia
White Machy. Co., A. D., 108 N. Jefferson
St., Chicago

Wright, David A., Jefferson & Monroe Sts.,
Chicago

Shafts, Flexible

Stow Flexible Shaft Co., Philadelphia

Shafts, Steel

American Hollow Boring Co., Erie, Pa.

Shaper Attachment

Moore Co., H. A., Rochester, N. Y.

Shaping Machines

Cochrane-Bly Co., Rochester, N. Y.
Columbia Machine Tool Co., Hamilton, Ohio

Davis Machine Tool Co., Rochester, N. Y.
Fairbanks Company, The, New York

Milwaukee Shaper Co., Milwaukee, Wis.
Osborne & Sexton Machy. Co., Columbus, O.

Sellew Machine Tool Co., Pawtucket, R. I.
Simmons Machine Co., Albany, N. Y.

Smith & Mills Co., Cincinnati

Shears, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago

Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

T. H. Lewthwaite Machine Co., 417 E. 31st
St., New York

Tucker, W. C. & F. C., Hartford, Conn.
Whitney Metal Tool Co., Rockford, Ill.

Shears, Power

Hendley & Whittemore Co., Beloit, Wis.
Quickwork Co., St. Marys, Ohio

Classified Finding Index

Sine Bars

Way Co., A. F., Hartford, Conn.

Slotting Attachment for Planer and Shaper

Moore Co., H. A., Rochester, N. Y.

Slotting Machines

Clough, R. M., Meriden, Conn.

Sprockets

Cullman Wheel Co., 1344 Altgeld St., Chicago

Steel, High Speed

Herbert, Ltd., Alfred, 54 Dey St., New York

Steel, Tool

Herbert, Ltd., Alfred, 54 Dey St., New York

Stock Supports

Way Co., A. F., Hartford, Conn.
Will-Burt Company, Orrville, Ohio

Straightening Machines

Towsley Mfg. Co., John T., Cincinnati
Whitney Metal Tool Co., Rockford, Ill.

Swaging Machines

Ettn Mfg. Co., Toledo, Ohio

Tables, Circular

Cochrane-Bly Co., Rochester, N. Y.
Hinckley Machine Works, Hinckley, Ill.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Tap Extractors

Walton Co., Hartford, Conn.

Tap Wrenches

Alert Tool Co., Philadelphia

Tapping Machines and Attachments

Avey Drilling Machine Co., Cincinnati
Heaman & Smith Co., Providence, R. I.
Bicknell-Thomas Co., Greenfield, Mass.
Burke Machine Tool Co., Connecticut, Ohio
Greenfield Tap & Die Corp., Greenfield, Mass.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Rickert-Shafer Co., Erie, Pa.
Taylor-Shantz Co., Rochester, N. Y.
Turner Machine Co., Danbury, Conn.
Whitney Mfg. Co., Hartford, Conn.
Whitney Metal Tool Co., Rockford, Ill.
Workwell Eng. & Mfg. Co., 616 W. Monroe St., Chicago

Taps, Collapsing

Modern Tool Co., Erie, Pa.
Murphy Machine & Tool Co., Detroit, Mich.
Victor Tool Co., Inc., Waynesboro, Pa.

Taps and Dies

National Acme Company, Cleveland
Victor Tool Co., Inc., Waynesboro, Pa.

Threading Machines, Bolt and Stud

National Acme Company, Cleveland

Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago

Modern Tool Co., Erie, Pa.
Murphy Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland
Ready Tool Co., Bridgeport, Conn.

Tool Cases

Gerstner & Sons, H., Dayton, Ohio

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Cleveland National Mchs. Co., Cleveland
Ready Tool Co., Bridgeport, Conn.
Western Tool & Mfg. Co., Springfield, Ohio

Tools, Boring

Alert Tool Co., Philadelphia
Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
H. & W. Tool & Die Co., Cleveland

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Ready Tool Co., Bridgeport, Conn.

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Brown & Sharpe Mfg. Co., Providence, R. I.

Trucks, Machine Shop

Fairbanks Company, The, New York
New Britain Machine Co., New Britain, Conn.
Towsley Mfg. Co., John T., Cincinnati

Turntables

Canton Foundry & Machine Co., Canton, O.

Valves

Fairbanks Company, The, New York
Powell Co., Wm., Cincinnati

Valve Seat Planing Machines, Portable

Underwood Corp., H. B., Philadelphia

Vises, Drilling Machine

Ainslie Mchs. & Tool Works, Hartford, Conn.
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Armstrong Bros. Tool Co., 308 N. Francisco Av., Chicago
Carter & Hakes Mchs. Co., W. Winsted, Conn.
Thomas Elevator Co., 31 So. Hoyle Ave., Chicago

Vises, Machinists'

Hollands Tool Co., Erie, Pa.
New Britain Machine Co., New Britain, Conn.
Western Tool & Mfg. Co., Springfield, Ohio

Vises, Milling Machine

Carter & Hakes Mchs. Co., W. Winsted, Conn.
Cochrane-Bly Co., Rochester, N. Y.
Hardinge Brothers, 1770 Berteau Av., Chicago
Hartford Special Mch. Co., Hartford, Conn.
Sellew Machine Tool Co., Pawtucket, R. I.

Vises, Shaper

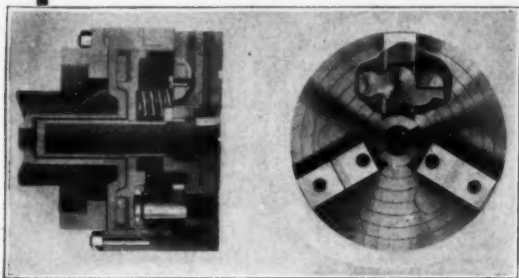
Columbia Machine Tool Co., Hamilton, Ohio

Wood Working Machinery

Hendley & Whittemore Co., Beloit, Wis.
New Britain Machine Co., New Britain, Conn.
Towsley Mfg. Co., John T., Cincinnati
Whitney & Son, Baxter D., Winchendon, Mass.

Index of Advertisers

| | | | |
|--|-------|---|---------------------|
| Abbott Ball Co..... | 66 | Fairbanks Company, The..... | 88 |
| Ainge Tool, Die & Machine Works, Geo. H..... | 118 | Federal Machinery Sales Co..... | 121 |
| Ainslie Machine & Tool Works.. | 64 | Frontier Chuck & Tool Co..... | 165 |
| Alert Tool Co..... | 46 | Frontier Machine Tool Co., Inc..... | 101 |
| American Hollow Boring Co..... | 44 | | |
| American Milling Machine Co..... | 33 | Gerstner & Sons, H..... | 50 |
| Anderson Bros. Mfg. Co..... | 62 | Gits Bros. Mfg. Co..... | 56 |
| Armstrong-Blum Mfg. Co..... | 15 | Grand Rapids Grinding Mche. Co.. | 70 |
| Armstrong Bros. Tool Co..... | 50 | Grant Mfg. & Machine Co..... | 40 |
| Atlantic Manufacturing Co..... | 126 | Graves Machinery Exchange..... | 145 |
| Atlas Press Co..... | 114 | Greenfield Machine Co..... | 71 |
| Aurora Tool Works..... | 102 | Greenfield Tap & Die Corporation | 74 |
| Avey Drilling Machine Co..... | 87 | Gwilliam Company, The..... | 66 |
| | | | |
| B. & W. Tool & Die Co..... | 46 | Hamilton Caster & Mfg. Co..... | 104 |
| Barnes Co., W. F. & John..... | 29 | Hardinge Bros., Inc..... | 27-116 |
| Bartlett, Edwin E..... | 115 | Harris Brothers Co..... | 146 |
| Bath & Co., Caryl J..... | 123 | Hartford Special Machinery Co.. | 82 |
| Beaman & Smith Co..... | 103 | Heald Machine Co..... | 4 |
| Bennett Co., W. R..... | 48 | Hendley & Whittemore Co..... | 7 |
| Bicknell-Thomas Co..... | 98 | Henry & Wright Mfg. Co..... | 91 |
| Bignall & Keeler Mche. Works.. | 117 | Herbert Ltd., Alfred..... | 48 |
| Bleasr Manufacturing Co., J..... | 132 | High Speed Hammer Co..... | 41-97 |
| Blount Co., J. G..... | 69 | Hill, Clarke & Co., of Chicago... | 151 |
| Borgeson Manufacturing Co., Inc. | 65 | Hinckley Machine Works..... | 34 |
| Brown Machinery Co..... | 125 | Hollands Tool Co..... | 12 |
| Brown & Sharpe Mfg. Co..... | 5 | | |
| Brownell Machinery Co..... | 132 | Johnson & Biddle Tool Co..... | 16 |
| Buchanan Chemical Co., C. G..... | 53 | Johnson & Sons Mchy. Co., Wm. C. | 131 |
| Bucher-Smith Co..... | 110 | Jones Machine Tool Co..... | 138 |
| Bunting Brass & Bronze Co..... | 39 | | |
| Burke Machine Tool Co..... | 36-96 | | |
| | | | |
| Canedy-Otto Mfg. Co..... | 99 | Keller Pneumatic Tool Co..... | 133 |
| Canton Foundry & Mche. Co..... | 60 | Knickerbocker Co..... | 61 |
| Canton Machine Shop Co..... | 130 | Knight Machinery Co., W. B..... | 37 |
| Carroll Fdry. & Mche. Tool Co... | 86 | Knowlton Machine Co..... | 17 |
| Carter & Hakes Machine Co..... | 76 | Kremer-Cummins Machine Co..... | 93 |
| Chattanooga Machinery Co..... | 109 | | |
| Cincinnati Specialty Mfg. Co..... | 60 | Lehmann Machine Co..... | 30 |
| Cleveland National Machine Co. | 52 | Lewthwaite Co., George A..... | 11 |
| Clough, R. M..... | 74 | Lewthwaite Machine Co., T. H..... | 18 |
| Cochrane-Bly Co..... | 19 | Little Co., W. P..... | 128 |
| Collis Company, The..... | 63 | Lombough-Jordan T. & M. Co..... | 8 |
| Columbia Machine Tool Co..... | 22 | Lourie Mfg. Co..... | 114 |
| Cooper Flexible Transmission Co., Inc..... | 64 | Lucas & Son, Inc., J. L..... | 121-126-132-136-137 |
| Cullman Wheel Co..... | 68 | Lynd-Farquhar Co..... | 138 |
| Curtis, Albert B., Estate..... | 58 | | |
| | | | |
| Dale Machinery Co., Inc..... | 149 | McCabe Lathe & Machinery Corporation, J. J..... | 134-135 |
| Davis Machine Tool Co..... | 26 | McCrosky Tool Corporation..... | 45 |
| Detroit Machine Tool Co..... | 80 | McDonald Machinery Company.. | 140 |
| | | McMullen Machinery Co..... | 142 |
| Edgemont Machine Co..... | 24 | Madison Manufacturing Co..... | 42 |
| Empire Machinery Exchange..... | 148 | Manhattan Mche. & Tool Works | 81 |
| Enterprise Machinery Co..... | 8-128 | Manufacturers Mche. Products Co. | 52 |
| Easley Machinery Co., E. L..... | 130 | Marshall & Huchart Mchy. Co... | 144 |
| Ema Manufacturing Co..... | 40 | Merkle-Korff Gear Co..... | 38 |
| Euclid Crane & Hoist Co..... | 54 | | |



Pilot Bar Chuck

Made in 8"-10"-12"-15"-18" sizes of either Two or Three Jaw Manufacturing or Adjustable Types

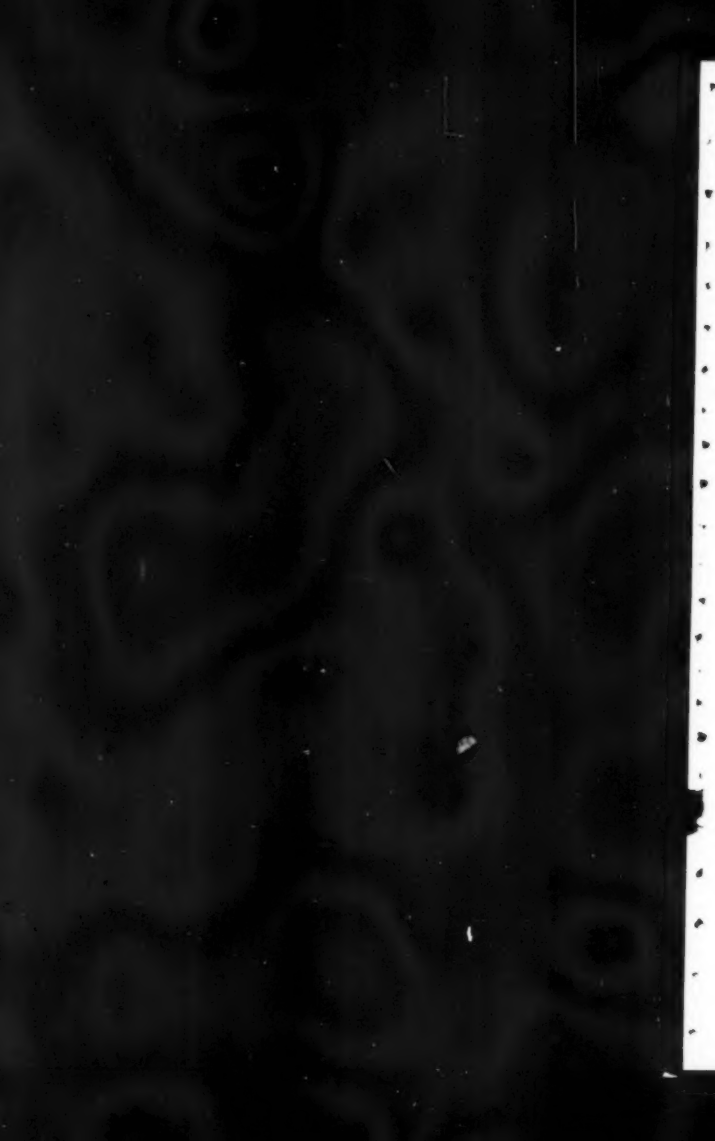
The Frontier Pilot Bar Chuck is designed to meet the conditions where tools must be piloted. It is of the same simple construction as the other types of Frontier Chucks and is attached to the working end of the spindle. The Pilot Bushing is screwed into the face of the chuck which makes it absolutely rigid and concentric with the outside diameter at all times. The Pilot Tube will allow pilots of any desired length to be used. This chuck will bear your investigation. We also manufacture standard chucks without pilot bushings and drill press chucks.

For full particulars—write—

Frontier Chuck & Tool Co., Inc.
30 Letchworth Street, BUFFALO, N. Y.

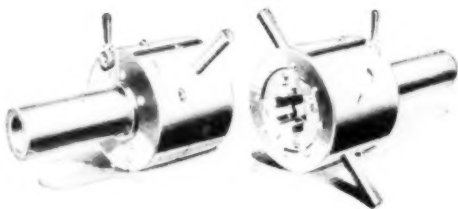
Index of Advertisers—Continued

| | | | |
|--|---------|---|---------|
| Michigan Machine Co..... | 56 | Sebastian Lathe Co..... | 124 |
| Miller & Sons, Otto A. | 79 | Second-Hand Machinery...121 to | 156 |
| Milwaukee Shaper Co..... | 22 | Sellew Machine Tool Co..... | 100 |
| Minster Machine Co..... | 94 | Sidney Machine Tool Co..... | 26 |
| Moback Tool & Machine Mfg. Co. | 47 | Simmons Machine Co., Inc. | 31-143 |
| Modern Tool Co..... | 167 | Sipp Machine Co. | 89 |
| Monarch Machine Tool Co..... | 28 | Smith & Mills Co..... | 20 |
| Moore Co., H. A. | 21 | Standard Lathe Works | 30 |
| Morrison Machine Products, Inc... | 116 | Steinle Turret Machine Co..... | 25 |
| Motch & Merryweather Mch. Company | 141 | Stocker-Rumely-Wachs Co..... | 152 |
| Mueller Machine Tool Co..... | 95 | Stoehr Machinery Co., A. M. | 130 |
| Mummert-Dixon Co..... | 92 | Stranahan Gear Co., Inc. | 38 |
| Murchey Machine & Tool Co.... | 43 | Strand & Co., N. A. | 72 |
| | | Strong, Carlisle & Hammond Co. | 51-122 |
| National Acme Company..... | 3 | | |
| National Machine Tool Co..... | 108 | Taylor & Fenn Co..... | 9 |
| Nazel Engineering & Machine Works | 13 | Taylor-Shantz Co..... | 105 |
| Nelson-Black Mfg. Co..... | 90 | Terrell's Equipment Co..... | 59 |
| New Britain Machine Co..... | 168 | Thomas Elevator Co..... | 49 |
| New York Machinery Exchange | 150 | Thompson Grinder Co..... | 75 |
| Nicholson & Co., W. H. | 111 | Toomey, Inc., Frank | 133 |
| Niles-Bement-Pond Co..... | 129 | Towley Mfg. Co., John T. | 112 |
| Northern Engineering Works..... | 54 | Tranter Manufacturing Co..... | 121 |
| | | Tucker, W. C. & F. C. | 57 |
| O'Brien Machinery Co..... | 131 | Turner Machine Co..... | 100 |
| Osborne & Sexton Mch. Co....20- | 139 | | |
| Ott Grinder Co..... | 70 | Underwood Corporation, H. B... 120 | |
| Oviatt & Co., D. C. | 144 | United Hammer Co..... | 6 |
| | | United States Drill Head Co..... | 35 |
| Partridge, E. O..... | 76 | United States Mche. Tool Co.... | 32 |
| Pawling & Harnischfeger Co.... | 94 | | |
| Pedrick Tool & Machine Co..... | 119 | Van Keuren Co., The..... | 82 |
| Peninsular Machinery Co..... | 121-153 | Velco Manufacturing Co., Inc.... | 108 |
| Peter Bros. Mfg. Co..... | 14-106 | Victor Tool Company..... | 42 |
| Potter Tool & Mach. Works, S. A. | 24 | Vonnegut Machinery Co..... | 156 |
| Powell Co., The Wm..... | 58 | | |
| Precision Truing Mche. & Tool Co. | 77 | Wahl Machinery Co., M. J..... | 142 |
| Prentiss & Co., Henry | 147 | Walther Machinery Co..... | 122 |
| Quickwork Co..... | 16 | Walton Co..... | 104 |
| | | Way Co., A. F., Inc..... | 118 |
| Ready Tool Co..... | 36 | Wayne Machinery Co..... | 132-155 |
| Reed Co., Francis | 98 | Weaver Mfg. Co..... | 113 |
| Reid Brothers Co., Inc..... | 73 | Wegner Mche. Works, Julius, Inc. | 140 |
| Reliance Elect. & Engineering Co. | 2 | Western Tool & Mfg. Co..... | 44 |
| Reliance Machinery Sales Co.... | 128 | White Machinery Co., A. D.... | 126 |
| Reynolds Machine Company..... | 55 | Whitney Mfg. Co..... | 67 |
| Rickert-Shafer Co..... | 107 | Whitney Metal Tool Co..... | 12 |
| Rockford Iron Works | 10 | Whitney & Son, Baxter D..... | 78 |
| Russell Machine Co..... | 127 | Willard Machine Tool Co..... | 23 |
| | | Willard-Middletown Mche. Co. | 10-34 |
| Savage Co., W. J..... | 14 | Will-Burt Company..... | 6 |
| Schmidt Co., B. L..... | 72 | Wilmarth & Mormon Co. | 83 |
| Scully-Jones & Co..... | 110 | Winterer, Herman L..... | 124 |
| | | Wisconsin Electric Co..... | 84-85 |
| | | Workwell Eng. & Mfg. Co..... | 106 |
| | | Wright, David A..... | 154 |



MODERN

Self-Opening Die Heads



WILL produce accurate, uniform parts at maximum speed consistent with material to be cut, and continue to do so the longest time without repairs. A strong claim that we'd like opportunity to prove.

MODERN TOOL CO.

MAIN OFFICE AND WORKS **ERIE, PA.** SECOND AND PEACH STS.

Branch Offices:

NEW YORK
PHILADELPHIA

CHICAGO
CLEVELAND

DETROIT
BUFFALO

"New Britain"
Stacking Tote Boxes
Hold Their Shape



They combine great strength with minimum weight. Electrically welded throughout—no rivets. A $\frac{3}{4}$ -in. selvage around the edges increases their stiffness. Two ball-round runners perform the double duty of making them easy to drag and of opposing any tendency to spring in under heavy weights, when stacked, by coming in contact with the sides of the box below. Can be trucked several high over uneven floors without unstacking.

May we tote along Bulletin No. 1224-B?

The New Britain Machine Company

**"Shop Furniture
Originators"**



**New Britain,
Conn. U.S.A.**

